

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

VOL. XVII. NO. 7.

APR. 1, 1889.

S. W. Cornell

189

PEACE • ON • EARTH •
GOD • WILL • FAVOR • MEN



CALE ANING'S
IN

BEE CULTURE

DEVOTED
TO
THE
BEE

& HOME INTERESTS.

MEDINA • OHIO •

BY

AL ROOT

TERMS, ONE DOLLAR PER YEAR.

YAMMING, DUNCAN, & C.

ENTERED AT THE POSTOFFICE, MEDINA, OHIO, AS SECOND-CLASS MATTER.

GLEANINGS IN BEE CULTURE.

ADVERTISEMENTS.

We require that every advertiser satisfy us of responsibility and intention to do all that he agrees, and that his goods are really worth the price asked for them. Patent-medicine advertisements, and others of a like nature, can not be inserted at any price.

Rates for Advertisements.

All advertisements will be inserted at the rate of 20 cents per line, Nonpareil space, each insertion; 12 lines of Nonpareil space make 1 inch. Discounts will be made as follows:

On 10 lines and upward, 3 insertions, 5 per cent; 6 insertions, 10 per cent; 9 insertions, 15 per cent; 12 lines of Nonpareil space make 1 inch. Discounts will be made as follows:

On 48 lines (½ column) and upward, 1 insertion, 5 per cent; 3 insertions, 10 per cent; 6 insertions, 15 per cent; 9 insertions, 20 per cent; 12 insertions, or more, 25 per cent; 24 insertions or more, 33½ per cent.

On 96 lines (whole column) and upward, 1 insertion, 10 per cent; 3 insertions, 15 per cent; 6 insertions, 20 per cent; 9 insertions, 25 per cent; 12 insertions, or more, 33½ per cent; 24 insertions or more, 40 per cent.

On 192 lines (whole page), 1 insertion, 15 per cent; 3 insertions, 20 per cent; 6 insertions, 25 per cent; 9 insertions, 30 per cent; 12 insertions or more, 40 per cent; 24 insertions or more, 50 per cent.

No additional discount for electrotype advertisements. A. I. Root.

CLUBBING LIST.

We will send GLEANINGS—
With the American Bee-Journal, W'y (\$1.00) 1.75
With the Bee-keepers' Magazine, (50) 1.45
With the Canadian Bee Journal, W'y (1.00) 1.75
With the Bee Hive, (30) 1.20
With the Bee-keepers' Review, (50) 1.40
With the British Bee-Journal, (2.62) 3.25
With American Apiculturist, (\$1.00) 1.70
With all of the above journals, 6.40

With American Agriculturist, (\$1.50) 2.25
With American Garden, (2.00) 2.60
With Prairie Farmer, (1.50) 2.35
With Rural New-Yorker, (2.00) 2.90
With Farm Journal, (50) 1.25
With Scientific American, (3.00) 3.75
With Ohio Farmer, (1.00) 1.90
With Popular Gardening, (1.00) 1.85
With U. S. Official Postal Guide, (1.50) 2.25
With Sunday-School Times, weekly, (2.00) 2.25
With Drainage and Farm Journal, (1.00) 1.75
[Above Rates include all Postage in U. S. and Canada.]

FLAT - BOTTOM COMB FOUNDATION.

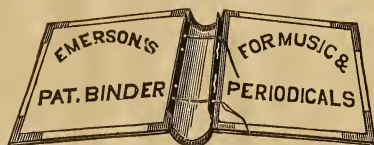


High side-walls, 4 to 14 square feet to the pound. Circular and samples free.

J. VAN DEUSEN & SONS.

5tf Sole Manufacturers,
SPROUT BROOK, MONT. CO., N. Y.

In responding to this advertisement mention GLEANINGS.



You can not look over the back No's of GLEANINGS, or any other periodical with satisfaction, unless they are in some kind of a binder. Who has not said—"Dear me, what a bother—I must have last month's journal and it is nowhere to be found?" Put each No. in the Emerson binder as soon as it comes, and you can sit down happy, any time you wish to find anything you may have previously seen, even though it were months ago.

Binders for GLEANINGS (will hold them for one year) gilt lettered, for 60 cts.; by mail, 12 cts. extra. Ten, \$5.00; 100, \$45.00. Table of prices of binders for any periodical, mailed on application. Send in your orders. A. I. Root, Medina, Ohio.

Names of responsible parties will be inserted in any of the following departments, at a uniform price of 20 cents each insertion, or \$2.00 per annum, when given once a month, or \$4.00 per year if given in every issue.

Untested Queens

FOR \$1.00 FROM JULY 1ST TILL NOV. 1ST.

Names inserted in this department the first time without charge. After, 20c each insertion, or \$2.00 per year.

Those whose names appear below agree to furnish Italian queens for \$1.00 each, under the following conditions: No guarantee is to be assumed of purity, or anything of the kind, only that the queen be reared from a choice, pure mother, and had commenced to lay when they were shipped. They also agree to return the money at any time when customers become impatient of such delay as may be unavoidable.

Bear in mind, that he who sends the best queens, put up most neatly and most securely, will probably receive the most orders. Special rates for warranted and tested queens, furnished on application to any of the parties. Names with *, use an imported queen-mother. If the queen arrives dead, notify us and we will send you another. Probably none will be sent for \$1.00 before July 1st, or after Nov. If wanted sooner, or later, see rates in price list.

*A. I. Root, Medina, Ohio.
*H. H. Brown, Light Street, Col. Co., Pa. 7tf89
*Paul L. Viallon, Bayou Goula, La. 7tf89
*S. F. Newman, Norwalk, Huron Co., O. 7tf89
*Jos. Byrne, Ward's Creek, East Baton Rouge

C. C. Vaughn, Columbia, Tenn. 21tf88
Wm. L. Ashe, Edwardsville, Mad. Co., Ill. 11tf88
J. M. Jenkins, Wetumpka, Ala. 9tf8

*Oliver Hoover & Co., Snyderstown, Northum-
5-15d berland Co., Pa.
Abbott L. Swinson, Goldsboro, Wayne Co., N. C. 5tf8

Hive Manufacturers.

Who agree to make such hives, and at the prices named, as those described on our circular.

A. I. Root, Medina, Ohio.
P. L. Viallon, Bayou Goula, Iberville Par., La 7tf89
C. W. Costellow, Waterboro, York Co., Me. 7tf89
R. B. Leahy, Higginsville, Laf. Co., Mo. 21tf88
J. M. Jenkins, Wetumpka, Ala. 3tf8

Oldest Bee Paper in America—Established in 1861.

AMERICAN BEE JOURNAL,

16-page Weekly—\$1.00 a year.

Sample Free. THOMAS G. NEWMAN & SON,
925 West Madison Street, Chicago, Ill.

BEE-KEEPER'S GUIDE.

Every farmer and bee-keeper should have it. 15th thousand just out; much enlarged, beautifully illustrated, and fully up to date. It is both practical and scientific. Price \$1.50. To dealers, \$1.00 by mail to any address. In 100 lots, 50% off by freight. 17-15d Address A. J. COOK,

Agricultural College, Mich.

In responding to this advertisement mention GLEANINGS.

POULTRY SUPPLIES.

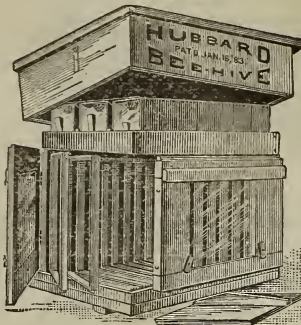
Ground Beef Scraps, fresh and pure at all times. Pure Ground Oyster Shells, Cracked Poultry Bone, Bone Meal, and everything else in this line, of the best quality and at lowest prices. We have large facilities for the manufacture of Poultry Supplies. Send for trade price-list. John Gardiner & Co., 21 N. 18th St., Philad'a, Pa.

In responding to this advertisement mention GLEANINGS.

Contents of this Number.

After-swarms.....	258, 261	Hives, Cost of.....	248
Ailfaria.....	254	Hives, Large or Small.....	259, 266
Attire for the Apiary.....	253	Hive for Comb Honey.....	262
Bees in Town.....	256	Honey in Paper Packages.....	261
Bees, Diseased.....	248	Honey Yield.....	248
Bees, Purchasing.....	248	House-flies.....	265
Bee-caves.....	259	Mice in Hives.....	264
Blacks vs. Italians.....	263	Out-apiaries, Colonies in.....	247
Brood-chambers, Size of.....	262	Ramble No. 13.....	251
Chaff around Brood nest.....	261	Reports Encouraging.....	266
Circulars Received.....	279	Robbers, Thwarting.....	262
Clover, Alsike, in Droul.....	248	Saliva, Function of.....	260
Colony, The Starving.....	254	Season, Pred cting.....	259
Columbus Exhibit.....	256	Snoker-lighters.....	264
Editorial.....	279	Sorghum for Bees.....	263
Ernest's Ramble.....	277	Start, To Make a.....	263
Exhibits at Fairs.....	252	Swarming Without Queen.....	265
Extractor, Non-reversing.....	263	Sweet Potatoes, All About.....	273
Frames, No. Used..... (Q. B.)	268	Tarantula a Jumper.....	268
Frames, Hanging..... (Q. B.)	269	Territory, Exclusive.....	264
Frames, Bearings..... (Q. B.)	270	Waste Felt vs. Chaff.....	264
Gauge, The Parallel.....	264	Wax-moths.....	248
Heads of Grain.....	262	Willow for Honey.....	266
Heart's ease.....	260	Wings of Insects.....	249
Hetherington's History.....	255	Workers from Large Cells.....	264

FORT WAYNE, IND.



CIRCULARS FREE.
ASK FOR SAMPLE ONE-PIECE SECTION IF YOU WANT IT.
G. K. HUBBARD,
277 S. HARRISON ST.,
FT. WAYNE, IND.

Italian Bees and Queens.

Tested queen, \$1.50; untested, \$1.25. Bees, per lb., \$1.00. Frame of brood, 50 cts.; 3-frame nucleus, containing 2½ lbs. of bees, 2 L. frames of brood and tested queen, \$4.50. Queens reared from imported mother. Mismatched queens, 50 cts. each. Send card for price list. **MISS A. M. TAYLOR,**
78d Box 77, Mulberry Grove, Bond Co., Ill.
In responding to this advertisement mention GLEANINGS.

50 Colonies of Bees for Sale.

In order to reduce my stocks. Same are Italians, in L. hives, with combs built on foundation mostly wired. Price \$5.00 per colony. Will ship as early as weather will permit, and guarantee safe arrival.

ADOLPH VANDEREIKE,

7d Lake Mills, Jefferson Co., Wis.

Apr. 1. For 60 Days. 1889.

We have on hand a large stock of one-piece sections, which are first class. To reduce stock we will name very low prices for the next 60 days, in any size lots from 1000 to 100,000 or more. Save money by letting us know what you want. Other supplies to correspond in price. Price list free.
7tfdb **SMITH & SMITH,**
Kenton, Hardin Co., O.

I like begets like, then I know you will like my well-liked Brown Leghorns. Eggs, \$1.00 per 13; \$1.50 per 26. Price list free.
7tfdb **A. F. BRIGHT,**
Mazeppa, Minn.

PURE ITALIAN BEES & QUEENS.

Full colonies and nuclei, per frame, 60c. Tested queens, \$2.00; after June 1, \$1.50. Untested queens, \$1.00; after June 1, 75c. Remit by postoffice money order, registered letter, or draft on New York. For any other information, address

C. W. JONES & CO.,

4-9db Bryant Station, Maury Co., Tenn.

1889. Italian Queens. 1889.

Having moved 8 miles from Nicholasville to a better location for bees, I will continue to raise queens, and more extensively than formerly. I will have the very best of Italians only. Select tested queens, in April, \$3.00; May, \$2.50; June, \$2.00; July 1 to Nov. 1, \$1.50. Queens warranted purely mated, \$1.00; 6 for \$5.00. Make money orders payable at Nicholasville. Send for circular.

Address **J. T. WILSON,**

4-5tfdb Little Hickman, Jess. Co., Ky.
In responding to this advertisement mention GLEANINGS.

JAPANESE BUCKWHEAT. Per bu., \$1.50; per ½ bu., 80 cts.; per peck, 50 cts. By freight or express, not prepaid.
7d **J. F. HIXON,**
Sir Johns Run, Morgan Co., W. Va.

If you are ever annoyed by the scraping and breaking of combs; killing bees when setting a frame to one side, or hanging it in the hive; sagging at the bottom and getting waxed fast; shaking about when moving a hive; in short, if you dislike to pry and wrench your frames, break combs, and kill bees while handling them, you will be pleased with this hive.

VERY CONVENIENT. AGENTS WANTED.
For "1st Principles in Bee Culture." It tells how to Divide, Transfer, Introduce Queens, Feed, Unite, Stop Robbing, &c. Money returned upon return of book, if you are not satisfied.
In responding to this advertisement mention GLEANINGS.

BEE-HIVES, SECTIONS, ETC.

WE make the best bee hives, shipping-crates, sections, etc., in the world, and sell them cheap. We are offering our choicest white one-piece 4¼x4¼ sections, in lots of 500, at \$3.50 per 1000.

Parties wanting more, write for special prices. No. 2 sections, \$2.00 per 1000. Catalogues free, but sent only when ordered. 1tfdb

C. B. LEWIS & CO., Watertown, Wis.

In responding to this advertisement mention GLEANINGS.

DADANT'S FOUNDATION

Is kept for sale by Messrs. T. G. Newman & Son, Chicago, Ill.; C. F. Muth, Cincinnati, O.; Jas. Heddon, Dowagiac, Mich.; F. L. Dougherty, Indianapolis, Ind.; B. J. Miller & Co., Nappanee, Ind.; E. S. Armstrong, Jerseyville, Ill.; E. Kretschmer, Coburg, Iowa; P. L. Viallon, Bayou Goula, La.; M. J. Dickason, Hiawatha, Kansas; J. W. Porter, Charlottesville, Albemarle Co., Va.; E. R. Newcomb, Pleasant Valley, Dutchess Co., N. Y.; D. A. Fuller, Cherry Valley, Ill.; J. B. Mason & Sons, Mechanic Falls, Maine; G. L. Tinker, New Philadelphia, O.; Jos. Nysewander, Des Moines, Ia.; C. H. Green, Waukesha, Wis.; G. B. Lewis & Co., Watertown, Wisconsin; J. Mattson, Atwater, Ohio; Oliver Foster, Mt. Vernon, Iowa; C. Hertel, Freeburg, Illinois; Geo. E. Hilton, Fremont, Mich.; J. M. Clark & Co., 1409 15th St., Denver, Colo.; Goodell & Woodworth Mfg. Co., Rock Falls, Ill.; J. A. Roberts, Edgar, Neb.; E. L. Gould & Co., Brantford, Ontario, Canada; J. N. Heater, Columbus, Neb.; O. G. Collier, Fairbury, Neb.; C. D. Battey, Peterboro, Madison Co., N. Y.; G. K. Hubbard, Fort Wayne, Ind., and numerous other dealers.

We guarantee every inch of our foundation equal to sample in every respect. Every one who buys it is pleased with it.

Write for free samples, and price list of bee-supplies and specimen pages of the new

REVISED LANGSTROTH BOOK,

Edition of 1889.

3tfdb

CHAS. DADANT & SON,
Hamilton, Hancock Co., Illinois.

In responding to this advertisement mention GLEANINGS.

FOR SALE CHEAP.

One second-hand Barnes saw with scroll attachment, in good order. One large Pelham fdn. mill, but little used; 300 good combs in L. frames.
6-7d **GEO. E. BOGGS,** Waynesville, N. C.

HONEY COLUMN.

CITY MARKETS.

MILWAUKEE.—*Honey.*—Honey in fair demand. Best 1-lb. sections, white, 17@18; second same, 16@17; best 1-lb., dark, 15@16; second same, 14@15. If damaged and leaky, 10@12½. Extracted, in bbls., white, 8@8½; in half-bbls., 8½@9. Amber, in half-bbls., 7@7½; dark, in same, 6@6½; white, in tin and kegs, 9@9½. *Beeswax.*—Nominal, 20@22.

Mar. 26. A. V. BISHOP,
Milwaukee, Wis.

ST. LOUIS.—*Honey.*—There is some demand for choice white-clover comb honey in 1-lb. sections, which is hard to supply, as there is none on the market. It would sell readily at 15. Common comb and extracted honey is plentiful; comb, 10@13. Extracted, in bbls., 4½@6, as to quality; cans, 5½@7½, as to quality; cans, 5½@7½, as to quality.

Beeswax. 21@22. W. B. WESTCOTT & Co.,
Mar. 22. St. Louis, Mo.

CINCINNATI.—*Honey.*—No change worthy of note from our last quotations. There is now no overproduction by any means, nor an overstocking of the market. Demand is slow for all kinds of honey, and prices low. We quote extracted honey at 5@8 on arrival; comb honey at 12@15, in the jobbing way. *Beeswax* is in good demand, and brings 20@22 on arrival for good to choice yellow.

Mar. 21. CHAS. F. MUTH,
Cincinnati, Ohio.

BOSTON.—*Honey.*—Our market is very short of fancy white honey, and sales are good. We quote: Fancy one-pound, 18@20. Same two-pound, 17@18. Extracted, 8@9. *Beeswax*, 24.

Mar. 22. BLAKE & RIPLEY,
Boston, Mass.

NEW YORK.—*Honey.*—There is no demand, except for dark extracted, of which supplies are small. Comb honey is all sold. We quote extracted California honey at 7½@8½. Basswood, 8@9. Cuban, in bbls., 6½. *Beeswax.*—Yellow, 24; half white, for foundation, 28. F. G. STROHMEYER & Co.,
Mar. 22. New York City.

ALBANY.—*Honey.*—Market about over for this season, with very little stock and very little demand. We advise bee-keepers to use ¾-pound sections; not only increases prices, but causes much greater consumption. H. R. WRIGHT,
Mar. 22. Albany, N. Y.

ST. LOUIS.—*Honey.*—Market unchanged. Could sell some in barrels at 6½@7½. *Beeswax*, prime, 21.
Mar. 22. D. G. TUTT GRO. Co.,
St. Louis, Mo.

KANSAS CITY.—*Honey.*—Honey is in fair demand. 1-lb. comb, 15; 2-lb., 13. Extracted, 8.
Mar. 22. CLEMONS, CLOON & Co.,
Kansas City, Mo.

DETROIT.—*Honey.*—Prices are somewhat lower; best honey in one-pound sections selling at 15@16. Extracted, 8@9, in tin cans. *Beeswax*, 22@23.

Mar. 22. M. H. HUNT,
Bell Branch, Mich.

BEE-KEEPERS' SUPPLIES SAVE FREIGHT.

BUY YOUR SUPPLIES NEAR HOME.

Shipping facilities good. Send for price list of every thing needed in the apiary. 7tfdb

C. P. BISH, St. Joe Station, Butler Co., Pa.

Bees! Bees! Bees! Yes, Bees!

Bees by the pound. Italian queens and 100 swarms of Italian bees for sale. Hives in flat, 40 cents each. Sections, one-piece, \$3.25 per 1000. Every thing needed in the bee-business, at rock-bottom prices. Send for price list and discount sheet for 1889.

R. E. SMITH,
Box 72, Tilbury Center, Ont., Can.

1000 Lbs. Bees with Queens and Brood.

Bee Supplies, Honey, &c. Price List Free.
Oliver Foster, Mt. Vernon, Linn Co., Iowa.
Mention Gleanings. 7-10db

CARNIOLAN QUEENS

From imported mothers. Untested queens, \$1.00; tested queens, \$2.00. J. B. KLINE'S APIARY,
7-10db Topeka, Kansas.

OH! RING THE BELLS!

OH! RING THE BELLS! THE MODEL B. HIVE CO. is coming to town with the New Jersey Bee-Hive, Nicest, Cheapest, Handiest, and Best; most complete 1½-story movable-comb hive in use. Takes L. frames crosswise. Thousands of them sold side by side of leading hives. Price \$2.50. Particulars and testimonials upon application.

GREAT SCOTT!

Bee-Keepers, Look Here! Brand-new, bright, fresh, clean, and pure brood comb foundation, 38 cts. per lb. Address

7d Model B. Hive Co., W. Philadelphia, Pa.

☞ This ad. will not appear again. Mention GLEANINGS.

HALF-PRICE!

SOMETHING FOR THE GOOD WIFE.

Any one sending us \$3.50 for 1000 FIRST-CLASS SECTIONS or \$4.00 worth of other supplies may have one of our SELF-HEATING CHARCOAL SMOOTHING-IRONS for \$1.50, which is half-price. For description, send for circular, or see adv't in GLEANINGS for Oct. 15, 1888.

SMITH & SMITH,

7tfdb Kenton, Hardin Co., Ohio.

☞ In responding to this advertisement mention GLEANINGS.

Pure Italian Bees For Sale

Two-frame nuclei, \$3.50; 3-frame, \$4.00. Full colony in A. I. Root's Simplicity hive, \$7.00. Each nucleus and full colony to contain a fine tested queen, and plenty of bees and brood, all on wired L. frames, combs drawn from foundation. To be shipped in May. Safe arrival guaranteed. Hives new, and every thing first-class. I shall do by all as I would be done by.

N. A. KNAPP,
7-10db ROCHESTER, LORAIN CO., OHIO.

☞ In responding to this advertisement mention GLEANINGS.

Send for Sample of MY IMPROVED Lawn Bee-Hive,

With neat portico, cover, and bottom-board, nailed, and painted inside and out, lettered and numbered; 8 metal-cornered brood-frames with fdn. starters, 1 enamel sheet, 1 Heddon honey-board, painted edge; 1 T super, painted, filled with sections, fdn. starters, and separators, boxed and delivered at depot for \$4; on order for 10 hives the price of sample will be deducted. Money returned if not satisfactory. Write for prices in quantities. Early queens, nuclei, pounds of bees, full colonies, and supplies for sale.

J. C. FRISBEE,
Prop. Evergreen Lawn Apiary. Suffolk, Nanse. Co., Va.
Mention GLEANINGS. 7-19d

Minorcan Queens.

Very prolific, and tolerably docile. No foul brood known. Will be sent from April to October, by mail, on receipt of \$2 greenback in certified letter.

F. C. ANDREU.

7-8-9d Port Mahone, Minorca, Spain.

☞ In responding to this advertisement mention GLEANINGS.

CONVENTION NOTICE.

The first meeting of the Fayette Co. Bee-keepers' Association for the year 1889 will be held at the residence of J. W. Gillispie, Washington C. H., O., Apr. 11th, at 10 o'clock A.M. All members are cordially invited to be present, as the election of officers for the ensuing year will take place on that day; also other important business. S. R. MORRIS, Sec.



Vol. XVII.

APRIL 1, 1889.

No. 7.

TERMS: \$1.00 PER ANNUM, IN ADVANCE; 2 Copies for \$1.90; 3 for \$2.75; 5 for \$4.00; 10 or more, 75 cts. each. Single number, 5 cts. Additions to clubs may be made at club rates. Above are all to be sent to ONE POSTOFFICE.

Established in 1873.

PUBLISHED SEMI-MONTHLY BY

A. I. ROOT, MEDINA, OHIO.

Clubs to different postoffices, NOT LESS than 90 cts. each. Sent postpaid, in the U. S. and Canada. To all other countries of the Universal Postal Union, 18 cts. per year extra. To all countries not of the U. P. U., 42 cts. per year extra.

OUT-APIARIES, NO. IV.

HOW MANY COLONIES IN EACH OUT-APIARY?

A GAIN we have a question to which no one is able with any positive assurance of correctness to give an answer. I think, however, the drift of opinion, of late years, has been toward a smaller number than in former years was thought possible. On page 905, GLEANINGS for Dec. 1, 1887, in reply to the question, most of the respondents agree on somewhere from 50 to 100, a good share of them having had no actual experience. Of those who have had experience, the answers show considerable diversity of opinion. Geo. Grimm says, "About 100 colonies." Dadant & Son say, "We do not want to exceed 100 colonies in any apiary." James Heddon says, "I keep about 200 colonies, spring count, in each of my apiaries." R. Wilkin says of Southern California, "About 300 colonies, provided no other bees are within three miles of you." E. France says, "We think our location will work 80 colonies, spring count, in each yard, profitably." There, you can read over those answers and then *guess* what will be right for you. P. H. Elwood says, "We keep from 70 to 100, spring count. Our neighbors crowd us some. Fifty would suit me best for best results, three miles apart, but we can't always put them just where we want them." Capt. Hetherington writes, "Our practice is to put 70 first-class stocks in an apiary—in a few cases 80, spring count. We find an advantage in about this number, as a man (with perhaps an assistant) will drive to such an apiary, *complete* the necessary work, and return the same day. With a larger number he could not do it; with less there is waste of time on the road." You see, Capt. Hetherington very wisely does not rest his decision entirely upon what may suit the

bees alone, but makes an important factor of the convenience of the apiarist.

Let us plan a little. Suppose you settle upon 70 as about the right number for a full day's work, and that you think there ought not to be more than 100 in one apiary. You have only one out-apiary, and a total of 200 colonies. You might put 70 colonies in the out-apiary, but then that would leave 130 at home—too many. Put 100 in the out-apiary and the 100 at home will be all right. You go to the out-apiary to-day and go through 70 colonies, leaving 30 that you must go and finish to-morrow. Manifestly, you might just as well go in the opposite direction to do those 30 to-morrow. So in general, whenever you have more than enough colonies to make a full day's work in each out-apiary, the best thing will be to start another apiary. Where you have the 200 colonies for your three apiaries, it is somewhat a question of convenience whether to keep 100 at home and 70 in one and 30 in the other out-apiary, or 100 at home and 50 at each of the others, or to divide the 200 about evenly between the three apiaries. If it makes no difference as to convenience of work, the last plan is probably the best. Please bear in mind, that although 100 may do well in one locality, 70 may do a little better, and 50 a little better than 70. "But," you say, "if there is clover enough to give 100 colonies all and more than they can do, how could a smaller number do any better?" Well, the clover doesn't last all the season. If it did there would be no object in having less than 100 in a place. Although the main crop of honey depends on a very few sources in one locality, as clover, linden, and perhaps buckwheat, yet there are a great many other sources from which bees get a little, from some more, from some less. This varies throughout the season, there being a very short time, if indeed

there is any, when bees can find absolutely nothing upon which to work. Suppose at the poorest time in the season there is enough to keep only two colonies busy, then different times aggregating four or five weeks when 15 colonies can be kept busy, a few weeks when 40 colonies have all they can do, and so on, till we find a few weeks of clover when 100 colonies have all they can do. I think it is pretty evident that the two colonies occupying the whole field during the entire season will make a better average yield than the 100, and as you diminish the 100 your yield will gradually increase till the number gets down to two. Understand I don't say there will be any immense difference between 100 and 75, but still I think there will be some difference, and in making our plans we may as well keep in view the principle that the smaller the number the better chance each colony will have.

C. C. MILLER.

Marengo, Ill.

PURCHASING BEES.

QUESTIONS ANSWERED.

I AM requested to answer some questions in GLEANINGS, by one who says that he is a beginner in bee-keeping, he having been induced to go into the same by getting hold of a sample copy of the above-mentioned paper. In reading it he was seized with what is known as the "bee-fever," so has concluded to purchase some bees. He has subscribed for GLEANINGS, and thinks that I am just the one to answer his questions. In this last I think he has made a mistake, but will try, in brief, to do the best I can. He first asks what price he ought to pay for a colony of Italian bees in a movable-frame hive. Much depends upon the season of the year, and the condition of the colony. They are usually sold at from \$4 to \$6 in the fall, and from \$8 to \$10 in the spring. The reason for the difference in price is that, of late years, there seems to be much risk in wintering, nearly 75 per cent of the bees throughout all the United States being lost during one or two of our worst winters, while the average loss for the past fifteen years has not been much less than twenty per cent. If ten or more colonies are purchased of one party, the price should not be above the lowest figures given, for each colony. In an average season, and in a favorable locality, such a colony of bees should give 50 pounds of honey, besides one good swarm. The honey would readily bring ten cents per pound, or \$5, and the swarm should be worth \$4 without the hive, in the fall, which would nearly give the purchaser his money back, even if he lost the old colony, or fifty per cent of his bees, during the next winter.

DISEASED BEES.

He next asks, "Are bees subject to disease or epidemics?" There is only one disease of any account among bees, aside from our wintering troubles, and that is termed "foul brood." The cause of our wintering troubles, "doctors" do not agree upon, some claiming that continued cold causes it, others that it all comes through the pollen which the combs contain, while others talk of confinement, dampness, lack of ventilation, etc. Whatever may be the cause, our greatest mortality occurs during the latter part of a long, steady cold winter, an open winter being favorable to the successful wintering of bees, as the present season is

proving. Foul brood is of a different nature. The character of the season has nothing to do with it. So far no one knows the cause, except to guess at it. However, all agree, that the disease is carried in the honey. One bee-load of honey taken from a diseased hive to a healthy colony is sure death, in time, to that colony; so the greatest possible care should be used, where a colony is discovered having the disease. For symptoms and cure, see late volumes of GLEANINGS.

COST OF HIVES.

He next says he thinks of making a hive "14 x 22 x 11, with an outer shell for chaff, the whole to be covered with tin, and painted," and desires to know about what the cost would be. I should guess about \$4.50 for a single hive; while if 10 to 25 were made, \$3.75 each ought to buy them, including frames, sections, and all. But let me ask, "Why make such a hive?" It is out of the regular size, and could not possibly give better results than any of the hives now in use. There are four styles of hives in general use; the Langstroth, Quinby, Gallup, and American, any of which would give as good results as the one spoken of, and at much less cost, while any of them can have the chaff box fixed on the outside of it. Besides, all of the sections, frames, etc., to these hives fit the shipping-cases, extractors, and other conveniences, manufactured by most of our supply-dealers. A complete Langstroth hive can be bought for about \$2.00. It is one of the mistakes made by many beginners, in thinking that they can get up a hive "just a little better than the older heads have done," thus causing much complication in our business.

HONEY YIELD.

Then he wants to know, "How much honey should an Italian colony average annually?" Very much would depend on the location and management. Taking the United States together, the average yield among specialists is about 50 pounds per colony, spring count. Some years give double this amount, others very little or nothing at all. My average yield, for the past 16 years, has been not far from 80 lbs. to the colony, which I had in the spring. Best average (1877) was 166 pounds; poorest, about 30 pounds.

ALSIKE CLOVER.

Next he asks, "Does alsike clover suffer from drouth?" To about the same extent as does red clover, as it has a very similar root; but no kind of clover is infallible as to its honey yield. Very dry or very wet weather is against the secretion of nectar in flowers, and especially are cool or cold nights damaging. The last, in my opinion, are the cause of more failures of honey than all other causes combined, unless it be weeks of cloudy, rainy weather, together with high winds, which prevent the bees from leaving their hives in search of stores. There is an occasional season, when bees are kept at a loss in some localities, as all bee-keepers are willing to testify—seasons when they hardly get a living during the summer months, saying nothing about laying up stores for winter. However, the alsike clover is about as sure a yielder of honey as any thing which we have.

WAX-MOTHS.

"Is there danger of losing colonies by moths or other insects?" is the last question. The larva of the wax-moth is about the only real enemy which the bees have in the insect line. These feed upon the combs, and burrow through them, and in very

weak colonies often nearly or quite destroy them, changing them by consumption from the nice symmetrical cells for brood and honey, into a mass of webs and cocoons. However, there are no strong colonies destroyed from this source, especially Italians. In fact, where pure Italian bees are kept exclusively, these pests are rarely ever seen. Still, combs not protected by bees, especially those having pollen in, are always subject to their ravages, and should be looked after during warm weather. If signs of worms appear, the combs should be placed in a tight barrel or box, and fumigated with burning sulphur, having all fixed so that there can be no possible danger from fire. All combs taken away from the bees during the fall, winter, or early spring, are comparatively safe till swarming time, if hung an inch or so apart, so that the air can circulate freely through and about them.

G. M. DOOLITTLE.

Borodino, N. Y., Mar. 18, 1889.

WINGS OF INSECTS.

PROF. COOK TELLS US SOME WONDERFUL THINGS ABOUT THEM.

THERE is something in the very words "wing" and "flight" that stirs the imagination and wakes to life all the poetry and sentiment that there is within us. Even as practical people as are you and I, brother Root, feel a sort of thrill and uplift as there comes to our ears, either upon the wings of memory or song: "Oh had I the wings of a dove, I would fly." Indeed, there are very few of us so stolid and inert that we are not roused, interested—yea, pleased—as we note the swoop of the osprey, the graceful curves of the swift-flying night-hawk, the easy, gentle motion of the listless butterfly, or the quick, arrow-like descent of the industrious bee. All of these are interesting, fascinating, and have claimed a large place in song and story all down the ages. In this article, however, I shall ignore sentiment and poetry, and aim to describe accurately only the insect's wing.

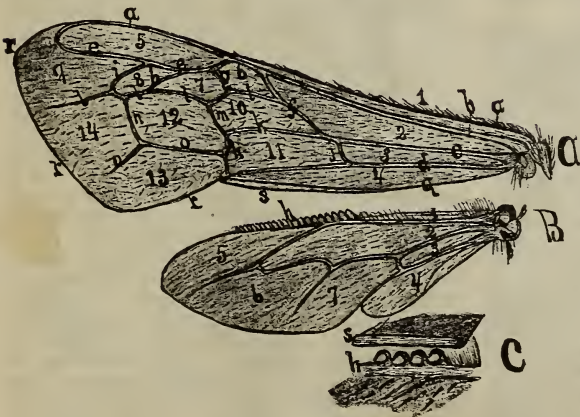


FIG. 1.—AN ENLARGED VIEW OF A HONEY-BEE'S WING.

The wing of the honey-bee, Fig. 1, is long, strong, and narrow. Such a wing, called falcate, indicates rapid flight. A bee or fly will rival a fast-running horse in speed. This same fact holds with birds. The hawks, pigeons, and night-hawks are noted for

their easy, graceful, and, upon occasion, their rapid flight. Their wings are all falcate. Our common meadow-lark has a labored, awkward, and lazy flight. Its wings are broad and short. Among insects the butterfly has a slow flight and broad wing.

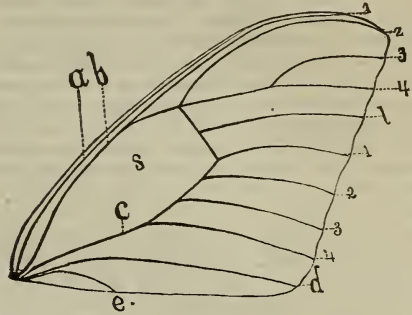


FIG. 2.

The insect-wing consists of a thin membrane spread upon a framework of veins, or nerves. These veins are hollow, and so carry nourishment—blood and air—to the wing. The veins vary greatly in number and strength. Thus in the higher insects the veins are few and strong; in the lower, many and frail. In the lowest order of insects—*Neuroptera*—the veins are so numerous that they resemble lace, and we have the common name, lace-wings.

According to our modern philosophy of development, which now is universally accepted by scientists, we should expect much variation in organs as useful as are wings, and it is so. Thus the wings are useful in defining orders, and even lower groups down to species. Indeed, the names of the orders come from the character of the wings. *Hymenoptera*—the highest order, including bees, wasps, ants, etc., have four membranous wings, hence the name, which means membranous wings. So the word *Lepidoptera*, used to designate the order of moths and butterflies, means scaled wings,

and was given because of the shingle-like scales which adorn such insects. These scales rub off easily, and so the care required in handling moths, if we would keep our specimens in first-class order. The name *Diptera*—two wings—refers to the fly order, including mosquitoes, house-flies, bot-flies, horse-flies, etc. The word is very appropriate, as it means two wings. Thus we have *Coleoptera*, sheathed wings, for the beetles; *Hemiptera*, half-wings, for the bugs. The wings of the typical bugs are thick at the base, and appear like half-wings. Thus they are only half-wings in appearance. *Orthoptera*—straight wings—includes the crickets, grasshoppers, etc., whose front wings are long, slim, and straight. *Neuroptera*—or nerve wings—is very appropriate for the lowest orders, as is also their

common name of lace-wings. Here are found the dragon-flies, day-flies, ant-lions, etc.

There are five main veins in the best-developed wings. Thus (see Figs. 1 and 2) *a* is known as the costal vein, or nerve; *b*, the sub-costal; *c*, the medi-

an, or externo-medial; *d*, the sub-median, and *e* the internal or anal. The large open space in the wings of butterflies (Fig. 2) is called the discoidal area. In the higher orders the cells are all named. Thus, in the bee (Fig. 1), 1 is the costal cell; 5 the marginal, and 6, 7, and 8 the sub-costal, or cubital cells. These are very much used in classifying and describing different bees. Thus, the cells will be alike in bees of the same genus. All hive-bees will have wings as in Fig. 1; so the bumble-bees—*Bombus* will all have similar wings; and the carpenter bees—*Xylocopa*—etc. In entomology, then, we are ever studying these wings, for they are one of the most sure keys with which to unlock the curious relationships. Insects may and often do look very much alike; yet a study of the wings will show they are widely apart.

When insects like bees, wasps, butterflies, moths, etc., have two wings on each side, which act as one in flight, they are usually hooked together. In the honey-bee there are from eighteen to twenty-two of these hooks (Fig. 1, *h*, *h*), on the front, or costal margin of the hind or secondary wing. These hook into a fold of the front wing (Fig. 1, *s*). This fold is on the hind margin of the wing, which folds up and over. In butterflies and moths there is but one hook, which is close to the base of the wing.

Many insects are apterous, or have no wings. In such cases there are usually structural indications that the ancestors of such insects possessed organs of flight. In these ancestors, owing to changed habits, the wings were not used, and nature snatched them away. I am sure nature abhors a useless member, whether of an animal or of society. We can often see nature whittling away these organs. Thus we often see insects with wings weak and abortive. The insect, from its mode of life, has ceased to use its wings; and nature says, "If you tie up my gifts in a napkin, I shall take them away." Just as nature says to us, "Think, study, or soon you will have no brain power for thought and study; exercise, or soon you will have no muscles to work with." What a unity—a oneness of plan—runs all through nature! Even the study of nature alone, proclaims that there is *one* God, and he is in all and over all.

The rate of flight in insects is marvelous beyond comprehension. The bee flies often twenty miles an hour, while very tiny flies will often keep abreast of a horse in full speed. Landois, judging from the pitch, finds that the bee's wing may vibrate 440 times per second. While there is no doubt about the truth of this statement, the fact baffles comprehension. The sole use of the wings of most insects is for flight. A few insects, however, like the crickets, locusts, and grasshoppers, use them to voice their feelings. The love-note of the grasshopper, cricket, and katydid, is produced by motions of the wings alone, or of the legs and wings. Thus the insect chorus which sounds by day and night during the warmth and sunshine of summer and autumn is but the love-songs of these myriad Lilliputs. These songs which "rasp the silence" are sure signs that sentiment and emotion reach even to the lesser forms of animal life; and while they are no proof that insects possess ears, they do show clearly that insects have a very delicate sense, whereby they take account of vibrations.

Agricultural College, Mich.

A. J. COOK.

Well, old friend, you have given us one of the grandest talks above that ever came

from your pen. I did not know before that you felt a thrill whenever a winged insect passed by; and I have sometimes thought that I was more imaginative than most people, when that thrill comes to me over and over again, suggesting that somewhere or some time we too shall be wafted through the air. I do not know whether it is coming through machinery or by the aid of some great bird that shall be bred up on purpose to carry people through the air; but I am certain that God, in his infinite plans, has this in store for us. We breed horses for great burdens, and also for speed—why not birds? By the way, who will tell us the most fit bird to commence with? I suppose the brothers and sisters down south will laugh again if I suggest turkey buzzards as being somewhere in the line. They are gentle, and have enormous wings. They can already carry a considerable burden, for I have seen them do it. Friend Cook, there is one more problem that has troubled me sorely, that I do not find touched in your talk at all. Why does an up-and-down motion, or, in fact, any sort of motion of a flat wing, like the wing of a bee, carry it aloft in the air? I have read some learned papers on this subject, but they do not satisfy me. I can understand how a bird flies, because the wing is concave; but why does the paddling motion of a butterfly with its wings enable it to soar aloft? Every spring, when butterflies come around, I watch and ponder; but I have not got any further than the old gentleman who replied to his good wife on a various lot of problems, "Case it does." The motion of the wings does enable them to fly, but I do not see why. Then, again, there is a species of bugs that have a coarse dark overcoat under which they tuck their gauzy wings to keep them nice. It always reminds me of a city belle putting away her gauzy laces and trimmings in a big Saratoga trunk. When these bugs alight you would think they could never tuck the filmy wings under these black shells at all; but they fold them all under very quickly and very neatly; and when the sun comes out they manage in some way to get them spread without very much fuss or bother either. When fighting squash-bugs alone, sometimes I have been tempted to waste time in seeing the little rascals fetch out their wings when I got at them. My daughter, Mrs. Calvert, has a pet canary bird that flies all over the house. It alights on her head and shoulders, flits from one hand to the other when she is doing her work, and a study of the deft and skillful way in which that bird uses its wings awakens that same thrill you have mentioned. The bird has become playful, and it is the wonder of "Root village" to see how much sense can be packed away in such a little mite of golden feathers. No doubt it is true that God takes away our talents that are unused; but don't you forget, dear friend, to mention that the reverse is also true—"To him that hath shall be given"? Just as sure as we begin to develop the talents we have, a vast extent of unexplored region begins to unfold itself before our wondering eyes; and it is right in this

line that I believe we are going to be able to enjoy flitting through the air by and by. Our proof-reader suggests another thought. Here in Medina just now it is exceedingly muddy. His thought is this: That it seems to be too bad that *man* should be compelled to walk through the mud, while even the *turkey buzzards* fly with such wonderful ease through the air.

RAMBLE NO. 13.

AMONG THE MOUNTAINS; RUINING THE HONEY MARKET, ETC.

"It's all very well for poets to tell,
By way of their songs adorning,
Of milkmaids who rouse to manipulate cows,
At five o'clock bright in the morning;
And of mooney young mowers who bundle outdoors,
The charm of their straw beds scoring,
Before break of day, to make love and hay.
At five o'clock bright in the morning."

THE Rambler considers it very unwise and unhealthy to get up before sunrise. This is an excellent rule to follow in the winter, and it is with regret that we see the days lengthen; but "old Sol" is inexorable, and he peeps into our window a little earlier every morning, and bids us arise. It is a noticeable fact, that those people who sleep in church are the ones who

Get out of bed, their house, and their head,
At five o'clock bright in the morning.

It is far better to take the needed sleep in the morning than to take time for naps during the busy hours of the day. I am led to thus discourse upon early rising because I thought the sun had forgotten to shed its morning beams on the Virgil mansion. Getting tired of waiting, I went out to see about it; and after waiting a little I saw a glorious sunrise over that rocky cliff.



"HELLO, OLD SOL! IS THAT YOU?" SUNRISE AT MR. VIRGIL'S.

I found Bro. V.'s headquarters in a small but convenient shop. The most of the work of getting out portions of hives, crates, etc., was done on a

home-made foot-power saw, which showed evidences of much hard work. The apiary did not look so bright as it would if more paint had been used, but it was evidently laid out for convenient work; and as the proprietor is after money and no poetical fixings, perhaps it is just as well. If the owner is pleased, the Rambler certainly is.

The honey-house was a neat little affair, crammed full of implements, and a few crates of very fine honey. Bro. V. keeps up with the times, and produces A No. 1 comb honey, and does not make much effort on extracted honey. Cappings and all pieces of comb are thrown into a barrel, and a heavy maul pounds all into a solid mass, proof against miller-worms, and in time it is rendered into beautiful wax, at which business Mr. V. is an expert. He is also an expert bee-hunter. Several swarms are secured every fall from the surrounding mountains. Cellar wintering is practiced, and, owing to the lowness and level nature of the land, the water floods the cellar at very inconvenient seasons; and perhaps early in March all hands have to work lively to get the bees out of the cellar to prevent total destruction. Still, Mr. V. has had very good success in wintering. I think I suggested the digging of a cave into that rocky cliff for wintering, which could be easily done.

After breakfast we struck out for other bee-keepers in the vicinity.



"IT DON'T PAY; I'M GOING TO NEW-BRASKA."

Mr. —, whom for convenience I will call Jones, we found with a score or more of colonies. This man's methods conflicted somewhat with Mr. V.'s. Several bee-keepers in this vicinity find market for their honey in Whitehall, a village of about 4000 inhabitants. Jones lives the nearest, about a mile; and as soon as a few pounds of honey are ready to come off, he trots it into the village and sells it at a remarkably cheap rate, demoralizing the market for those who have a better quality of honey in better shape. As a result there is any thing but good feeling toward him from those who have honey to sell in the same market. Mr. Jones's bees were mostly in box hives. He loved the bees, and wished he could work with them all the time. Not attaining much wealth, he wanted to sell out and go to "New-braska." The disease seemed to have a strong grip on him, and, from Mr. V.'s remarks about what a glorious country is found in the West, I had no doubt but he wished the "New-braska" fever would take his neighbor far away.

About three miles from Whitehall resides Mr. C. Beckwith, another of those enterprising young men who have tried many things and found much vexation of spirit where, to the imagination, things

were all lovely. Mr. B. had about 100 colonies; had purchased a steam-engine, saws, many tools, had invented a hive with a frame differing in size from any other he ever saw; and now, after getting up to 100 colonies, he wanted to sell out! Reasons, a large farm to manage, and he found raising potatoes, fighting bugs, milking cows, fattening pigs, or hunting woodchucks, all a bigger bonanza than bee-keeping. "Come, make me an offer for the whole business. Why, that pestiferous Jones, down by the toll-gate, has ruined my trade in the village; and if he wants to go to Neu-u-braska, we had better bundle him off to-morrow."

Nothing would console our friend Beckwith, and we left him, considering that nothing could remedy these cases of conflicting interests but co-operation, or the purchase of the stock of the mischief-maker. We find that, when the interests of many bee-keepers center in one moderate-sized town for the sale of their product, there is more or less conflict, resulting, perhaps, in a few, who have a good standard article, in withdrawing entirely from the local market and shipping to commission men.

I would ask Mr. J. A. Buchanan, who has given us much interesting information upon the sale of honey, if he has had this damaging competition in his experience, or how he could overcome it if it should arise. The Rambler has had some experience in selling honey through a farming community, and thus far has had no competition; but even if there were, we should be no worse off than nearly every salesman of other goods of whatever description. I find the best plan to sell honey is to combine it with the sale of some other articles, and keep the cart going all the year round. "A continual dropping will wear a stone;" so continual trips will wear away a big pile of honey in a year. If all the honey in a certain district were placed in the hands of a competent local traveling salesman, there would be but little to go to commission men. Hurrah for the honey-peddler, the sweetest man on earth! That's what all the gi-gir-boys say about the

RAMBLER.

P. S.—In relation to the age of pigeons when ready for market, I do not know. The authority from whom I got my information in relation to growth was a fancier, and did not grow pigeons for sale. I notice there is a difference of opinion between our prominent authors in respect to the preparation of food for the young bee. Cheshire claims that larval food is secreted by a gland located in the head of the bee, around the eyes. Cook claims that it is not a glandular secretion, but chyle, and that the glands merely secrete a ferment that aids in digesting pollen. Whoever may be right, we know there is a concentration of food, and in the pigeon we have an unquestionable demonstration of it on a comparatively large scale.

Thanks for your kind invitation to that California trip. Nothing would please the Rambler better than a visit to the Golden Gate; and as I have relatives in Oakland, I fear my visit would be prolonged should I get there. The editors of GLEANINGS are cordially invited to come east. The Rambler and many others are ready to extend such fare as they have, and the best of it, to those they have

known so long. Yes, that is the Rambler with his hands on his knees, but that can not be the R. at the blackboard—the person is too aldermanic. The R. wears a smaller vest. That man weighs 200 lbs.; the R. only 140, and 5 ft. 10 inches. R.

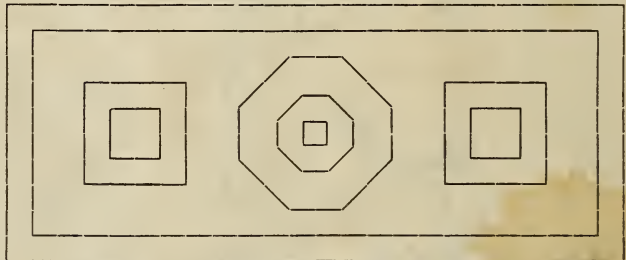
FIXING FOR HONEY-EXHIBITS AT FAIRS.

A BRIGHT SUGGESTION FROM FRIEND HOLTERMANN.

FRIEND ROOT:—I was much pleased with Dr. Mason's articles on the above subject, and also with the display of honey and bee-keepers' supplies at the Ohio Centennial. There is one point, however, which I did not like at all at Columbus; and now Dr. Mason has an illustration of this objectionable feature—"so, there now!"

The regular shelves (or irregular, if you like) as illustrated are unsightly, and particularly so if not completely covered by the exhibit. I have used them, and now avoid them, and try to break the monotony of the show as far as possible. In my estimation, a platform four or more feet deep, and the height of an ordinary table to start on, is desirable. Put your first shelf on this, as in Dr. Mason's illustration, but run it back the same distance as the table. Then place some of the boxes used in shipping goods to the exhibition (height about 15 inches and the right size) on the shelf thus described, and lay the boards which form the tops of crates for Stanley honey-extractors (being eight-sided as

here shown) on top of these boxes. Upon these eight-sided boards place other but smaller boxes, and then put on the top-board of the crate for an ordinary extractor, which is the same shape (8-sided) and much smaller. On top of this, put another box. Then toward the right and left ends of the shelf I build another pyramid, only smaller, and cover all with white paper (I claim there is no better color for covering), and then arrange my exhibit. The pyra-



HOLTERMANN'S ARRANGEMENT OF SHELIVING FOR EXHIBITS.

mid I can make still higher by placing upon it first a 10-gallon can, then a smaller; and on top of all, glasses with honey. It breaks the monotony of these shelves; and if you mix in comb honey in crates, which is desirable, a very neat display can be made. A few pots of flowers (the pot covered) add greatly to the display.

You can put a number of your cases in a safe place—quite an item when you would otherwise have to put your cases with thousands of others, and can not find them at the close of the exhibition, and realize you are not at home, where you could replace them.

There was a monotony about the extracted-honey

display which I did not admire. It is very difficult to break this with only extracted honey, in any case, but it is well nigh impossible with shelves. As before stated, the monotony can be broken nicely with a photograph, say of father Langstroth, then individual bee-keepers, or some of the many groups, diplomas received at previous exhibitions (of course these diplomas must be put in after the prizes have been awarded); cakes of nice wax, and flowers in pots, or cut flowers. It is a very good plan to bring along a honey-extractor, and combs with half of the combs on each side uncapped, and out of which you have extracted the honey previously. In this way you can show just how extracted honey can be secured. When bringing material for display, bring what is lightest, and will make the most display after considering their advantage otherwise. Articles bad for packing, avoid.

Brantford, Canada.

R. F. HOLTERMANN.

Friend H., I believe you are right. I have a great many times felt what you describe, when visiting exhibits at fairs. The same thing is also true in the arrangement of grounds, greenhouses, and gardens. A little bit of variety, even if nothing more than an octagon pyramid between two square pyramids, often gives a peculiar grace and charm to the whole arrangement that would be entirely lacking without it.

ATTIRE FOR THE APIARY.

MRS. HARRISON GIVES US SOME SUGGESTIONS IN REGARD TO THE WAY A BEE-WOMAN SHOULD DRESS.

I FEEL a little slow this morning, so I sit in the rocking-chair, with GLEANINGS in my hand, and admire Rambler in his pretty checked suit. I really believe he has a bow of natty ribbon at the bottom of his pants; perhaps the button was off, so he tied one around to keep out the inquisitive insects.

How I envy him that suit, because it is light, cool, and handy! I might raise "von tollar" and get one "zhust a ft"; but if I donned it, a policeman would whistle for the patrol wagon and take me to the calaboose on the double-quick. I should think the bees would investigate the inside of the blouse, as it appears so loose at the bottom; but then a belt buttoned around would easily prevent that. I've tried hats and veils many times, with the result of a pretty sore chin and neck. I could protect my nose, but I could not fasten the veil so that, in working, the bees would not sting through. The brim would keep the veil far enough from my face; but in stooping the bees would sit down on the back of my head and form a chain around my neck.

I want to dress according to my work, whether it is in the apiary, washing, or blacking a stove. In the apiary I have to guard against heat and stings. I have for many years worn a health-reform costume, with the idea in view of clothing the body so as to promote an equilibrium of circulation and warmth. In warm weather I wear a cotton suit, consisting of waist and drawers; formerly I wore them made in one garment, but I much prefer them separate. The waist is high neck and long sleeves, and is supplied with buttons at the bottom, for to button the drawers upon. The drawers reach to the ankles, and are kept in place with a

strap passing under the foot. I'm clothed when I have on these garments, and I've had bees creep up from my feet and come out at the neck, without stinging. The hose are drawn up over the drawers, and at times I fasten the sleeves tightly around my wrists. If I go to work in the apiary with slippers on, I generally have cause to regret it, as I get stung in the feet, so I wear a leather shoe.

When working in the apiary, if I had to wear corsets, bustle, and two or three skirts, I should cry out about bee-keeping being too hard work for women, just as Mrs. Chaddock does, and throw mud at those who venture to attempt it. I keep my bee-dress hanging in the honey-house; and when I work in the apiary I take off my house dress, hang it up, and put this on. When the thermometer is playing around one hundred in the shade, I wear a skirt and linen sacque. I put on my wire hat, then the sacque which covers up the cape, so no bees can possibly get at my head, fasten the sleeves tightly at the wrists, then the skirt. I do not let the bottom of the sacque hang loose; if I do not wear an apron tied around me I put the skirt-band over it. I'm not dressed for company, but for work in the apiary, protected from stings and from being overcome with heat. Should company call, or when dinner is ready, I retire to the honey-house, wash, and put on my ordinary clothing, which takes but a moment. I'm warm, and I need more clothing when I sit in the shade.

Women who are not very young or strong can do a great deal of work in the apiary if they manage well. We have about thirty colonies of bees on the east side of our house, and they are in the shade after two o'clock. If there are sections to be put on or removed, or any other work to be done here, I do it when the hives are in the shade. There are other colonies that can be worked with in the morning, when they are shaded. I could not work with the hot sun pouring down upon my head.

We run our apiary for comb honey, but I extract several hundred pounds every year, and in a quiet way, so that the family are not aware of it. When I know where I can get some honey to extract, I take my tin comb-basket, remove the filled combs to it, put empty ones in their place, and carry them to the honey-house. When I've extracted them I put them in the bucket, snap the cover over the uncapping-can, cover up the extractor, change my clothes, and no one knows what I've been doing, but find out next fall and winter. I never do any big day's work in the apiary, unless I am driven to it in swarming time.

MRS. L. HARRISON.

Peoria, Ill.

My good friend Mrs. H., I am glad you have given us these suggestions. As soon as I saw what Rambler had said, I remarked at once to Ernest that somebody should give us some suggestions for a woman's suit. I suppose you know that I do not at all believe or advocate that women should dress as men do, therefore I am glad you have such strict "police regulations" in Peoria. I think you have got the idea of a bee-dress for women exactly, if I understand you. A woman can dress just as comfortably as a man, and she can protect herself from stings; and then, for the very reason you give, she should have something light to throw over this working suit to make herself look womanly, and that she may not attract attention from passers-by.

Just one thing more, my good friend: If the police regulations could only "regulate or restrain" (prohibition would be out of the question, I suppose) the growing evil of—not intemperance this time—but those very bustles you have alluded to, Uncle Amos would feel happy, even if no one else did.

THE STARVING COLONY.

THE ALFILARIA.

Starvation's form sat grinning at their door—
Their only guard—what need had they of more?
They called a meeting then, in Sally Hall,
To see if they had means to live at all.
An aged warrior cried, "My race is run,
While many more of yours have just begun.
Three cells are left—a scanty store, I ween,
And I would move we leave them for the queen.
We may die slowly—singly—one and all—
But our dear queen must be the last to fall."
"I charge you now," she cried, with pleading eye,
"To tell us plainly if we have to die;
Tell us what foe we have to face or fear;
And quickly, too, or it shall cost you dear!"
"Arm! arm!" he cried, "'tis not the crack of doom
I come to tell; the 'filaree's in bloom!"
A shout went up that made the welkin ring,
And every bee began to *whet his sting*.
A round applause was given that shook the floor,
When all at once a scout stood at the door;
And he had that within his eye which told
That he had potent news to there unfold.
"Arm for the fight," he cried; "each warrior, arm!"
Each stood aghast, with terror and alarm!
And then the queen, to aggravate their fears,
Stood up and burst into a flood of tears.
The fainting queen fell helpless to the floor,
While all rushed pell-mell for the door.
And then they raised the song they always sing,
When every bee is *every inch a king*.
The scout and queen were then a happy pair;
For now she sang and wept for joy there.
But, hark! The first-returning song she hears,
And, starting up, she wiped away her tears.

I.

"O my queen mother! I come, I come,
Over mountain, hill, and dale,
Through the deep and silent vale.
Every thing was dry and stale—
I thought the very skies looked pale."

II.

"O my queen mother! I come, I come—
I hid me to a vineyard bare,
Where oft the bloom is rich and rare—
Found only desolation there,
As I swept through the silent air."

III.

"O my queen mother! I come, I come;
But further on—on lower ground,
A lovely green rosette I found—
Not only one—but they abound
In great profusion scattered round."

IV.

"O my queen mother! I come, I come;
I found the purple star was there;
And the green rosettes, so rich and rare,
Are coming up in thousands, where
The ground of late was stark and bare."

V.

"O my queen mother! I come, I come;
And here I now present to you
This shining drop of nectar new.
The purple star that's always true,
Now gives her first fruits unto you."

VI.

"O my queen mother! I come, I come;
A hundred now behind me stand,
With nectar from the vineyard land.
A sweet surprise the scout had planned
When we lay on the starving stand."

The alfilaria is one of the most nutritious grasses of California. It comes up first in well-worked, clean ground, in the shape of a green rosette. The rosette looks as if it were made out of small fern leaves. In the middle of it first appears a small purple star; then another and another, until the grass loses the shape of the rosette, and bears hundreds of flowers. It lasts until the black sage blooms. It lies so flat on the ground, when it first blooms, and the bees are so thick on it, that I have been often afraid of trampling them to death in walking over a patch of it.

Bees on this coast, so far as I have handled them, are more vicious and vindictive in the honey season than at any other time. In the dry season and in the fore part of the winter, they hang in the upper story of the hive, many times three inches deep. They seem to be listless and lazy, and are ashamed to look you in the face. I do not believe that over five per cent are in the air, at any one time during the whole time from the close of the honey season until the opening of the flowers the next year. I have thought that they keep only scouts out during all this period. Two or three puffs of smoke will settle them at this time, but it takes volumes of it to take off honey, or to go into the brood-chamber during the honey season. J. P. ISRAEL.

Olivenhain, San Diego Co., Cal.

Why, friend I., the very mention of alfilaria, especially as you put it, brings up many happy memories; and I want to say to our readers, that, when I first set foot on the soil of California, there was not a green thing nor a living thing to be seen on the mountains, and hardly any thing in the valleys—that is, without the aid of irrigation; but under the influence of a summer rain, in just a few hours the whole landscape became clothed with green, and a great part of the green came from the 'filaree. When I was a jeweler we used to have a certain kind of work which we called "filagree." Well, the filaree suggests just that. It comes up as grass, and I am told it makes excellent feed. The beautiful bright green has a sort of mellow golden tint that is sure of captivating any one who loves nature. In the most protected valleys I watched for the largest specimens, hoping I might catch a glimpse of the tiny flower, but I didn't; and inasmuch as there are thousands of acres of it, and it comes up spontaneously everywhere, I don't wonder that the bees rejoice when it comes in and saves from starvation perhaps thousands of colonies. I have so many times watched the bees in their rejoicings when the first honey came in from the soft maples, that I can readily imagine your poem to be true, at least in sentiment.

CAPT. HETHERINGTON.

AS A BEE-KEEPER—CONTINUED.

CAPT. HETHERINGTON is a skilled mechanic, and makes all of his supplies, including extractors, box-making machines, etc., even to the three dozen wheelbarrows he uses in his different bee-yards. The material is prepared, ready to put together, in his mill, five miles from home. He prefers, when he has to oversee a dozen or more men, and keep their machinery in order, to put that distance between himself and those who would call him from his work. His honey-boxes, clamps, cases, etc., are models of perfection and neatness. His packing-cases are of the whitest basswood, papered inside, so that there may be no leak, and the boxes rest on cross-cleats, so that the drip may be kept from them. At the Centennial his exhibit of 3500 lbs. in single-comb sections, together with a variety of ornamental packages of honey and wax, was admired by all. The exhibit was built up to represent the turreted front of an old castle, so arranged as to allow the light to pass through in the freest manner; the whole surmounted by the flag under which he fought for three long years. The highest prize was awarded him—a medal and diploma. Two years before this (1874) he had made a large shipment of comb honey to England, which Mr. Quinby said was the first sent abroad in quantity. At this early date he recognized that the relief for an overstocked market here must be sought abroad. It is to be regretted that our wholesale dealers have not persistently followed up this exportation, as there are but few difficulties to overcome, aside from the national prejudice of the average Briton that foreign products are not quite as good as home productions. Our climate is drier, and we have a better proportion of sunshine than England, conditions which should give our honey a superior body and flavor. While Mr. Cowan, editor of the *British Bee Journal*, did not admit this, other distinguished visitors have done so, and it is confidently expected that, in the not distant future, the early expectations of Capt. Hetherington will be realized, and that Great Britain will demand some of the products of our apiaries.

Messrs. Cowan and Young, on their recent visit to this country, recognized Capt. Hetherington as the most extensive bee-keeper in the country; and on his return, Mr. Cowan stated, in an address to the British Bee-keepers' Association, of which he is the recognized head, that at Cherry Valley, N. Y., he "met the most extensive bee-keeper in the world." This October his colonies number about 3000, located in twenty-two apiaries. The management of these large numbers must necessarily be in a systematic, wholesale way, to which we may fairly apply the word extensive rather than intensive. His results per hive should not be expected to equal those who keep a smaller number, cared for with the closest possible attention, although it can be said they do not fall far short. In a good many of the details of business, however, the word, "intensive" might very appropriately be applied, for in the mechanical perfection of his supplies of all kinds, and in the neatness and order displayed in every branch of his business, even to the minutest detail, he far surpasses the average keeper of a dozen hives. So well does he look after the details of his business that it would be difficult to inquire for any implement or article used, or rem-

nant left within a year, but that he could tell you where to find it.

As soon as possible after giving his bees a flight in the spring, he moves them away to his out-yards, which are situated from two to twelve miles from home. After this they are visited as often as may be necessary, at intervals varying from two days to two weeks. Usually, however, during the honey-gathering season, at some time between Monday morning and Saturday night, they are all seen. He hires a plot of ground on which to set them, and takes all the care of the bees. No one looks after issuing swarms, because he has no such swarms worth looking after. For some time after adopting the new Quinby hive he labored with Mr. Quinby to prevent swarming by giving shade, young queens, and plenty of room in surplus and brood apartments of the hive; and in 1868 he succeeded in preventing all increase from the 150 colonies then under experiment. What worked well in one season, however, did not succeed in all, and it was not until he practiced removing the queen that he was entirely successful in controlling swarming.

For some years he has used the T clamp and one-pound sections, glassed or unglassed, as the market demands. In the fall he moves his bees all back home, when they are weighed, their stores equalized, and they are prepared for winter. The principal forage at Cherry Valley is clover, basswood, and buckwheat, which last, being largely stored in the brood-apartment of the hive, usually insures sufficient stores for winter.

In connection with his last attempts at outdoor wintering, the captain experimented quite largely with plaster of Paris as a material for bee-hives, it being an excellent non-conductor of heat, and a good absorbent of moisture. But he soon discovered that, in common with the absorbents he had before used, in proportion as it became saturated with moisture it lost its non-conducting properties. He therefore, after the most thorough trial, abandoned, with almost all kind of hives and all kinds of packing, outdoor wintering, as unsuited to his severe climate, where a five-months' confinement to the hive is sometimes experienced. In this high mountainous region, successful wintering has been the most difficult point in practical bee-keeping, and perhaps always will be, as the honey-bee is indigenous to warmer climates, and, when removed to long winters, it does not bear confinement well unless every condition is perfect.

The captain finds it best in the fall to persistently weed out all swarms not up to a high standard of excellence. Some years as many as one-third are thrown out as unfit for the cellar. He takes personal supervision of this preparation for winter, and not long since he informed me that either he or his brother had examined every swarm as to quantity of bees and amount of honey. The writer, after spending some time in looking through his bee-yard, concluded this was the best lot of bees he ever saw. There were no second-quality swarms, and an old queen was the rare exception, for Hetherington has a decided preference for the first-year's work of a queen.

The captain is not at all satisfied with his wintering, notwithstanding his success of late has been much better than that of the average bee-keeper. In the spring of 1881 he took a carload of his weaker swarms as far south as Philadelphia, in order that they might avoid the chilling winds of the

North, and be benefited by the early forage and warmth of the South. The experiment was a success; but on account of wearing work he has since preferred to unite his weakest stocks early in the spring.

P. H. ELWOOD.

Starkville, N. Y.

To be continued.

THE CENTENNIAL HONEY-EXHIBIT.

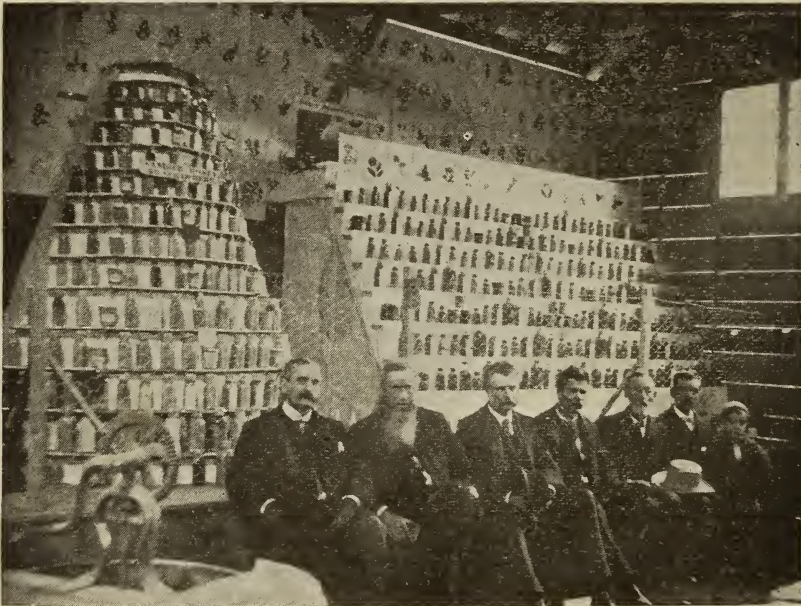
DR. MASON'S PYRAMID OF HONEY; A GLIMPSE AT A FEW OF THE BIG BEE-GUNS.

FRIEND ROOT:—Under the circumstances it seems to me that this picture, taken in a closed building, and with but little light, is a pretty good production for an amateur. It represents a portion of one of the honey exhibits at the Ohio Centennial at Columbus last fall, and is decorated by the faces of some bee-friends.

The man at the right is Mr. C. E. Jones, of Delaware, O., one of the exhibitors whose exhibit of

Mr. N. W. McLain, known to all your readers as the one having charge of the Government Apiarian Experimental Station in Illinois, and at his right sits "yours truly," who got a "racket" from Ernest because of his "wiggling" so as to spoil the face; but the splendid picture of the indefatigable worker, and editor of the *American Bee Journal*, Thos. G. Newman, makes up for any deficiency in mine.

In this picture, near the lower left-hand corner, is shown a portion of one of the side platforms on which the exhibits were placed. The wire poultry-netting, which I have mentioned before, is nicely shown, with three of the posts that held it up. Near the top of two of the posts were tacked cards of your \$1000 offer in regard to comb honey made by machinery. It seems to me it would be a good plan to have a goodly supply of these tacked up in conspicuous places at every exhibition of honey; and it might do no harm to have them on every crate of honey that leaves the producer's hands.



A PARTIAL VIEW OF THE APICULTURAL EXHIBIT AT THE COLUMBUS CENTENNIAL, WITH SOME OF THE PROMINENT BEE-MEN IN THE FOREGROUND.

comb honey, etc., I mentioned in my last; and to his left stands his little boy, Charley. Next to Mr. Jones is the one I have once mentioned as known by "our company" as "Uncle Aaron" Goodrich, of Worthington, O., an enthusiastic bee-keeper over 75 years old, one of the largest exhibitors, and who was awarded first premium on display of comb honey. Next to "Uncle Aaron" is shown Mr. J. Y. Detwiler, of New Smyrna, Florida, formerly of Toledo, O., who, at an expense of \$80, came to attend the meeting of the N. A. B. K. Soc'y, and to see the Exposition. He also acted as one of the judges in the Bee and Honey Department, H. D. Cutting, of Clinton, Mich., being the other judge. Whether it pays or not to attend bee-conventions unless one "has an ax to grind," as Mrs. Chaddock has said, Mr. Detwiler had no ax to grind, and he was one of the active ones in the convention. Next to him is

In this exhibit, a portion of which may be seen at the top, were shown about 150 honey-producing plants, mounted on strawboard, some of them being hidden from view by the persons in front, as was also a display of honey vinegar and different kinds of honey. Over Mr. Newman's left, and my right shoulder may be seen points of the nozzles of Bingham smokers, an assortment of all styles and sizes of which were here shown, with Bingham, Novice, Muth, and Murphy honey-knives. The Bingham smoker and honey-knife were awarded first premiums. In the lower left-hand corner is shown the gearing and a portion of the top of a Muth honey-extractor, exhibited by Dr. Besse.

The exhibit of honey shows for itself. The honey on the pyramid was linden (basswood), and, being very nicely candied, it made a pretty display, and was so frequently called sugar by visitors that

a sign was placed on it, as may be seen, which said, "Candied Honey. No Sugar Here." A few bottles of it had been drained and then stirred, so that not even an expert could tell that it was *not* sugar, without tasting. The editor of the *A. B. J.* refers to it in the number for Nov. 14, 1888, page 739. The pyramid was originally designed to be eight square; but as only about one-half of it would show, the back half was left off. The next week after the visit of those in attendance at the convention, your young man, W. B. Weed, took the pyramid in hand and decorated it and rearranged the honey, and made it a "thing of beauty." In the back concave side of the pyramid your men had a shelf on which they did their writing and kept their stationery, etc. In the rear of the straight shelves they had a bedroom and a wardrobe, the whole being inclosed by a door, as shown; and over the door, and but little shown in the picture, the sign, "Medina Headquarters." On the brace, near the upper central portion of the picture, a sign says, "Honey-producing Plants;" and above that another, on which may be seen, "Exhibited by Dr. A. B. Mason, Toledo, O."

To the left of this picture, and on the same platform, was a large exhibit of comb and extracted honey on shelves, 20 feet long, and extending nearly to the top of the side of the building. This belonged to "Uncle Aaron," whom I have before mentioned. In connection with this he made a fine display of very yellow beeswax, molded in different forms and sizes. It, of course, took the "red ribbon." He also had a display of five gallons of the lightest-colored honey vinegar I ever saw. It was as clear as the best water, and attracted much attention.

To the left of Uncle Aaron's exhibit was that of Dr. H. Besse, of Delaware, O., occupying 20 feet of the platform, and consisting of comb and extracted honey, beeswax in the form of round columns, foundation-mill, smokers, honey-knives, bee-literature, etc. On the platform in the center of the building I also exhibited a Given foundation-press on which foundation was occasionally made, to show people how it was done. Also a U. S. honey-extractor, with duplex reel; and being, as you know, an "extracted-honey man," I shall always want to have a honey-extractor along when showing extracted honey at fairs. I also had two single-comb nuclei with glass sides, so arranged on posts as to be readily turned to look on either side for the queen. On top of each was a sign, "Bees and Queens," and it took only an instant for some of us to gather a crowd around these nuclei, and start off in a "speech," giving a little of the natural history of the queen, workers, drones, etc., and we frequently had listeners that were very much interested in what we told, and would ask questions, and sometimes kindly thank us for the information we gave. Dr. Tinker, Mr. Elias Cole, and C. E. Jones, also had nuclei for showing queens, but they were not so conveniently arranged, as they had to be held, and were liable to be tipped over and broken.

The description of the exhibit in our department would not be complete without mention of your "one-piece section" machinery. Unfortunately for our display, this, in order to have power with which to operate it, had to be put in Power Hall, fully sixty rods, I should think, from the Bee and Honey building. It consisted of four new ma-

chines, placed in a space of 12 x 15 feet. An abundance of the very nicest basswood blocks had been prepared (in Medina, I suppose), dressed to the right thickness, and cut to the right length for sections and placed in boxes that would hold 500 sections. These blocks were first run through the machine that automatically makes the openings in the sides; then over the "gang" of saws that cut the notches in the ends; then the sections were cut from the side by a saw that left them almost, if not quite, as smooth as if they had been sandpapered. From this machine they were put into one that cut the V grooves. It was a marvel of ingenuity and simplicity, and it was "just fun" to see it work. All the attention it seemed to require was to have a lot of sections, few or many, placed within its reach, and it would, without watching, cut the V groove just right in every section, and drop the sections all complete, in a box ready to be packed for customers. A great many were given away as samples, and a large quantity of price lists were here judiciously distributed.

I am not aware that such an exhibit of bees, honey, and the appliances of the apiary, was ever before made in this country. It was a continuous display for forty days (Sunday excluded), and our building almost became a home to some of us. It was the regular sleeping-place for two of your men, Uncle Aaron, and myself, and Uncle Aaron and I "boarded" ourselves. Uncle Aaron gained in health and weight every day, and got a "new lease of life," which to a Christian man worth scores of thousands of dollars, was of more value than money; but to me the blessing came with a loss of over two pounds a week in weight, and I never felt better in my life. The loss of flesh in my case I attribute to worry. The boys "nagged" me, and poked fun at me, and laughed at me at every crook and turn; and visitors were not in the least loth to do the same. There seemed to be no end to my "putting my foot into it" (you know what that means) at the most inopportune times, and once I came pretty near getting a "licking" by a Chicago man (not our friend Newman), who knew more about "manufactured honey" than we did. I believe I must tell you about it. Owing to my getting so badly scared I may not get it just exactly as it was, but it will be near enough for all practical purposes. When any of "our boys" found out any thing new, or got "sold," or came across a specially hard or green customer, or one that probably never kept bees, or else kept them in the old-fashioned way, and knew more about them than we did, they were sure to bring such parties to me. Well, one day a company of ladies and gentlemen from Chicago were visiting our "neck of the woods," and one of the men was telling about having bought and used manufactured honey there ten years ago, and that "it was just as good as the honey made by bees." After talking with him awhile, and finding he knew more than I did, I *very mildly* suggested that it wasn't just right to be telling such stuff, as that way of making honey was "played out" in Chicago, and referred him to friend Newman. He rather excitedly said that he guessed a man had a right to say what he had a mind too. With as little discretion as truth I admitted it, but, unfortunately, added, "A man has a *right* to lie if he wants to." Well, his looks and actions induced me to get up from the seat I was occupying, and put down a package

of honey I had in my hands, and for an instant I didn't know but somebody would get hurt. He rather excitedly asked me, "Did you tell me I lied?" Did you ever! But I was in a fix. I simply replied that he didn't ask that question in the right way. So he took it back and wanted to know what he *should* say, and I very kindly informed him that he should say, "Did I understand you to say that I lied?" He at once repeated my words, and I very innocently replied that I did not *know* how he understood me. My reply showed my guilelessness, and his own company joined in the general laugh, and tried to get him away; but he seemed to have a liking for "our boys," and I asked them to let him stay with us awhile, assuring them that we would not hurt him, and would not even let our bees sting him if we could prevent them. So they all, except my friend, went of laughing and we gave them a cordial invitation to come and see us again. This was the only time, I believe, when there was a cloud on our horizon.

A. B. MASON.

Auburndale, O.

Well, old friend, it is too bad, and it makes one feel sad to think that those boys should have been so naughty as to nag and worry you in the way you mention. I do not blame them for laughing, because almost every one laughs as soon as he gets acquainted with you, and I did not know before that a man could be found with cheek enough to get mad, even if you did intimate to him that he was not telling the truth. I suppose you gave him one of those cards with the thousand-dollar offer on it, and that he went away thoroughly satisfied and thoroughly converted. I suppose a great many people went away from that honey-exhibit a little wiser in regard to this matter of adulteration, and I am inclined to think that you are about the best man to undertake the great task of getting such a great stream of humanity to give up error and accept truth. Our work is not done yet; and I hope, doctor, that you are still using your big gifts among the people wherever you meet them.

PREVENTING AFTER-SWARMS.

A. E. MANUM'S METHOD.

HAVING noticed in GLEANINGS and other bee-periodicals, from time to time, various plans to prevent second swarms, all of which I have tried without satisfactory results, and having finally adopted a method of my own which is somewhat different from any I have ever seen in print, I will, with your permission, give it to your readers, that another drop may be added to the great fountain of knowledge from which a clear and invigorating stream is constantly flowing over the pages of GLEANINGS.

As stated above, I have tried various plans to prevent second swarms by hiving in different ways, such as moving the old hive to a new stand, and hiving the new swarm on the old stand; also setting the old hive on the new swarm or the new one over the old; also hiving the swarms by themselves, and giving them a portion of the brood from the parent hive, etc. All of these have proved to be unsatisfactory to me, owing to the fact that these methods have a tendency to lessen the amount of surplus, since the old hive is so reduced

that it is a long while before it becomes strong enough to work in the boxes. Hence we have only the new swarm to depend upon for a surplus, where we depend wholly upon clover and basswood for box honey. I always aim to keep every colony strong—the ones that have cast a swarm, as well as the new ones. My experience teaches me that light swarms during the honey season give no profit. I would rather have half a bushel of bees in one hive than divided by two, hiving a peck in each hive, when the honey season is at hand.

In hiving bees, the plan that suits me best is to return one-third of the swarm to the old hive, and hive the remaining two-thirds in a new hive, and add to it, as soon as may be, one or more two-thirds swarms (without queens this time), each time returning the third of the bees to the hive from which they came. The surplus queens, if good ones, may be returned to their respective hives after cutting out all the queen-cells. By this method the old hive is kept well stocked with bees, and work in the boxes is but little interrupted; the new colonies are made very strong, and are in the best of condition to store a large amount of honey in the boxes. As I do not desire a large increase of colonies, I strive to secure a large surplus, regardless of increase.

To prevent second swarms I go to the hive four days after a swarm has issued, lift out the combs one by one, and cut out all queen-cells but one, leaving the best one if I wish to rear a queen from this stock; if not, all are cut out, and a cell from some other is introduced. Then in four days more I again cut out any queen-cells that may have been started, after which there is no danger of more being started. Now, when the young queen hatches and finds no rival, and the bees not being able to rear another, owing to the age of the brood, the young queen is permitted to leave the hive for fertilization, without the bees following her; and in due time she will commence to lay. But if the young queen is allowed to hatch *before* the other cells are removed, as recommended by some writers, even if the cells are removed very soon after the queen hatches, there is danger of a second swarm. But if all surplus cells are removed *before* the queen hatches, there is no danger of a second swarm; at least, that has been my experience the past few years.

One night last season my son reported six second swarms that day (this being only his second season in having charge of an apiary, and he had forgotten my instructions of the year before); upon inquiry I learned that he had not removed the cells the second time; or on the eighth day, thinking that, if he removed them soon after the young hatched from the cell left in the hive when looking them over on the fourth day after the swarm had issued it would be as well. But the result was six after-swarms in one day. I visited his yard next day, and assisted him to cut out the surplus cells from all that had swarmed seven or eight days previously, and cautioned him to attend to this matter in the future, which he did, and the result was no more second swarms.

It may be asked, why I cut out the cells so soon as the fourth day. My answer is, that it sometimes happens that a swarm is retarded from coming out, for some days, owing to bad weather or some other cause. In such a case the young queen will hatch sooner than the eighth or ninth day; hence this

precaution. As second swarms are unprofitable to me, I aim to prevent their issue; and by close attention I find they can be prevented.

Bristol, Vt., Mar. 12, 1889.

A. E. MANUM.

BEE-CAVES, AGAIN.

THE DOOLITTLE PLAN A SUCCESS.

AFTER reading Doolittle's article on bee-caves, in GLEANINGS, I am constrained to give my experience. I wintered, or tried to winter, bees on summer stands for eight years, and the result was far from being satisfactory. In the fall of 1886 I made me a cave 8x16 feet, and 5 feet deep at the eaves, in the ground. I put in a 3-inch drain-tile 50 feet long. To a suitable frame of studding and rafters I nailed inch lumber. Above and around I banked 3 feet of dirt, and then sowed with sweet clover. I have compartments in the rear end, 8x12 feet, and 4x8 in the front, for vegetables. There are three doors, including the trap-door, and an ordinary ground floor inside. When winter comes to stay (that is generally about Christmas), I fill the hatchway with straw, and shut it up till spring. A 3-inch pipe passes up through the top.

In the fall of 1886 I put in 42 colonies of bees. In the spring I took out 42 in fine condition; and what surprised me most was that the cave was dripping wet. I dug a hole in one corner of the cave, and I think I took out ten barrels of water in 15 days, and I could not detect any trace of dysentery about a single colony. In the fall of 1887 I put in 52 colonies, and next spring I took out 50 in prime condition. This time two died—one of which was queenless, and the other one starved from neglect in the fall. This time the cave was as wet as before, and two nuclei showed some signs of dysentery, and some of the bees were in the cave for just six months, from Oct. 15th to April 15th. This winter has been so warm that I have not filled the hatchway yet, and the cave is dry. I am in the cave almost every day. The bees are wintering well. I am convinced that a good cave is the place to winter bees in this latitude.

WHEN WE MAY EXPECT A GOOD HONEY CROP.

I want to tell your readers when to expect a good honey season (and that next year is one in Iowa, at least). My observation has been, that always, after a plentiful rainfall, the next year will be a good honey year; and a poor honey season always follows a dry season; a wet season gives the trees and herbs a good growth of fibrous roots, and this is what gives us a good supply of nectar.

Newbern, Iowa, Jan. 22, 1889.

WM. MALONE.

It seems a little singular that somebody else should have almost exactly the same idea you have in your concluding sentence. See the following:

ESTIMATING THE SEASON IN ADVANCE, IN THE LIGHT OF THE PAST; IS IT A CASE OF COUNTING CHICKENS BEFORE THEY ARE HATCHED?

Bees have wintered well to date, March 1st. I have 177 hives. I believe every one is all right.

Why can't some kind of correct estimate be given in advance as to what the honey crop will be for the season? For example, the season of 1889, according to indications, will give us a good crop. Why do I think so? I will explain. In this locality, during the fall of 1885 we had frequent rains; white

clover thrived everywhere. The fall pasturage was excellent. In 1886 we got a good crop of white-clover honey. The fall of 1886 was very dry. The grass and white clover burned out, even to the root. Hardly any white clover made an appearance in 1887. The fall of 1887 was dry, drier, drier, and I got no honey whatever in 1888 from white clover. The summer of 1888 was a fine one. White clover sprouted up luxuriously everywhere—little fine stuff, just from the seed. During the fall of that year the weather couldn't be better. The pasture was the very best for stock. Even now the white clover is green and in splendid condition to furnish us a crop of honey. Why is it this subject of a prospect of a honey-yield is never discussed, or is it too much like counting chickens before they are hatched?

A. N. DRAPER.

Upper Alton, Ill.

LARGE OR SMALL HIVES—WHICH?

A NUT FOR THE ADVOCATES OF SMALL BROOD-CHAMBERS TO CRACK.

SO much has been said in favor of small brood-chambers, I concluded to give them a trial. I commenced the experiment in July, 1886, putting 20 colonies, that season, on ten frames, said frames 6¼ inches deep, and same length as L. frames. During the summer of 1887 I put some 35 or 40 colonies more on these shallow frames. This divided my apiary about equally—half on ten L. combs, and the other half on the shallow frames. The season of 1887 was extremely dry and hot. The nectar from the flowers was, from the nature of the weather, of a very thick consistency—so much so that it required constant care on the part of the apiarist, in manipulating hives, to prevent the bees from robbing. Yet I secured nearly 6000 lbs. of honey from 98 colonies, spring count.

The season of 1888 was just the reverse of that of 1887, both as regards the nature of the weather and the nectar in the flowers. For six weeks during July and August, 1888, there was very little disposition on the part of the bees to rob. But I obtained only 4500 lbs. of honey from 108 colonies, spring count.

Now for the results from the different sizes of brood-chambers. In 1887 there was but little difference, and that was in favor of the large hives. In 1888 the large hives not only gave me nearly three-fourths of the surplus obtained, but had an abundance for winter stores, while the small hives were quite light when placed in the cellar, and will have to be fed early in spring to carry them through.

I have for several years entertained a theory in regard to storing and evaporating the moisture from honey, and this theory is substantiated by the past two years' experience.

The statement that *all* the honey goes into the surplus receptacles when small brood-chambers are used is quite true, as there is no other place for it. But it is my opinion, that few if any of the advocates of small brood-chambers know how much they lose by not having sufficient room for storage and evaporation of nectar, especially when, from the nature of the weather, the nectar is very thin, as is often the case in wet seasons. Notwithstanding the many plausible arguments presented by able writers in favor of small brood-chambers, I

would not give my past two years' experience for whole volumes of such arguments. What would you think of the man who would set to work to produce 500 gallons of syrup per day, with an evaporating capacity of only 250 gallons per day? Somewhat ridiculous, is it not? Yet this is about the condition of affairs when put to the actual test.

Liverpool, Ill., Feb. 12, 1889.

S. A. SHUCK.

FUNCTION OF SALIVA.

PROF. COOK REPLIES.

I HAVE found no time before this to reply to the kind criticism of Mr. S. Corneil, in GLEANINGS, 1888, p. 931. I did say, in my first criticism of Cheshire's first volume, that the author's statement, that the "principal function of our saliva is to change starch into sugar, is a strange error." I am still of that opinion. I do not believe that any real experimental physiologist will disagree with me. I regret if my assertion in commenting upon Mr. Stachelhausen, that "we secrete saliva almost wholly to moisten our food," makes me appear *morbidly* sensitive. I really am not so. I am sensitive regarding what I deem erroneous. I have no feeling whatever in this matter, nor do I believe Mr. Corneil has, other than that the truth should prevail. If I said that Mr. Cheshire stated that the sole use of saliva was to digest, I certainly quoted from memory. He says its principal function is to chemically change some parts of our food, and notably starch. Again, I say, "Most English authors, and Foster with the rest, argue that saliva may do a great part of the work." Mr. Corneil adds, "What Foster does say is this: 'Its characteristic property is that of changing starch into sugar'—no arguing that it may do in this statement." Now let me quote Foster, page 184: "The chief purpose served by the saliva in digestion is to moisten the food, and to assist in mastication and deglutition." *This is its chief purpose.* That its characteristic property is to convert starch into sugar, is true. There is scarcely a better test for saliva. That is why I said, "That saliva will change hydrated or cooked starch into sugar, no one doubts." Now, Mr. Editor, let me briefly add what I believe to be just the truth in the case—what I have taught my students for years, not because I have read it in books, but because I have actually proved it, as do my students, and as Mr. Corneil can with no very great trouble or pains. Saliva of man, the pig, rabbit, guinea-pig, and the rat, is amylolytic; that is, it will digest starch, though far less actively, than does pancreatic juice. The same thing is very feebly true of the saliva of the cat, or horse, and sheep, while that of the dog is not so at all. But this is true of no saliva, except in an alkaline liquid. Thus, if we take cooked starch—only cooked or hydrated starch is acted on by any saliva—and simply put it into the mouth for a moment, a trace of sugar will appear. If, then, starch should remain in the mouth, and be mixed for some time with saliva, it would largely, perhaps wholly, change to sugar; but it stops only to be moistened, and is rushed forward to the stomach, where it is mixed with the acid gastric juice, and then the saliva is entirely powerless to digest the starch further. It did commence, but stopped before it had more than just begun. But when the starch reaches the

small intestine, and is mixed with the far more amylolytic pancreatic juice, it is speedily changed to sugar, or, in other words, digested. Now for the proofs:

First, only cooked starch is ever digested by saliva. The tropical man, then, who eats his starch raw, must depend wholly on other ferments for this digestion.

Second, feed a rabbit cooked starch. While we find a trace of sugar in the mouth, as we do in our own case, we find no more, only a mere trace, in the stomach. We see that, while the saliva has this property, it does not have this function. It can do it in an alkaline liquid—it can't in an acid one, like the juices of the stomach.

Third, while our saliva in the mouth will digest starch, and does very slightly, it will not do this if in a test-tube we add hydrochloric acid—the acid that makes the juices of the stomach acid; so we know that this change is at once cut short as the food enters the stomach.

Fourth, one element of the pancreatic juice does this work much more energetically than does the saliva, even in the mouth, and so there is no call for such action from the saliva, which is simply to moisten or soften the food, as Bernard's classic experiments showed years ago.

Fifth, the horse and cow eat much starch, and their saliva can't do this work. If the pancreatic juice does this for them, it would be logical to suppose that it does the same for all animals, especially as direct experiment proves that it can and does.

Sixth, the salivary glands and the saliva are as marked in dogs, cattle, horses, etc., as in man; but in these animals we know it does not digest starch. This, then, shows that the saliva has a separate function, which we know to be to soften the food.

I have made many experiments in this field, and have no doubt of the correctness of this position. I have suggested how others may prove the truth of it, as Fehling's test for sugar is simple, and easily applied.

We see that this matter in physiology is of practical importance. We must eat slowly, that the saliva may be thoroughly mixed with the food, and the food well cut up, else it will be impossible to digest the food properly when it arrives in the stomach and intestines. Bolting our food is not hygienic.

Agricultural College, Mich.

A. J. COOK.

HEART'S-EASE HONEY.

HOW IT GRADES WITH OTHER HONEY IN THE MARKET.

A SUBSCRIBER OF GLEANINGS writes me as follows: "Please tell through GLEANINGS how heart's-ease honey grades in Chicago, as compared with white clover, linden, etc. It is considered A 1 here among farmers. . . .

Do you think I could do as well with the extractor? Do you think extracted as profitable as comb? Also, what do commission men generally charge per pound? Three short crops can be secured here in one season—first, white clover; second, basswood (by moving bees $3\frac{1}{2}$ miles); third, heart's-ease."

The honey gathered from heart's-ease is not as light-colored as that from white clover or linden, and has a somewhat stronger flavor. A well-ripened article, though, when granulated, looks almost as white as clover. It granulates in very fine crys-

tals, forming a smooth, even grain, perfectly dry, but not quite as hard as a good article of clover. Let me remark, in passing, that I do not consider any honey first-class unless it will candy so as to be hard and perfectly dry.

The comb made from heart's-ease is as white and delicate as any made. In most of our markets I believe it is usually graded and sold as white clover. With many dealers, all comb honey that is nice and white is white clover, while all that appears dark is buckwheat. This, to some extent, is true of extracted honey. Nearly all honey produced is from sources more or less mixed, according to the season and locality in which it was gathered. If you ask any large dealer in honey for samples of white clover you may get several different flavors, none of which you will recognize as the white clover of your locality. This being the case, there is a tendency among dealers to class all honey, that is reasonably light in color and mild in flavor, as white clover. A friend of whom I bought some honey almost entirely of heart's-ease, writes that a well-known Chicago dealer said of some more of the same lot, "It seems to be almost entirely white clover."

Tastes differ as to quality. Some do not like the flavor, others prefer it to any other variety, while some never learn to distinguish any difference between it and other kinds. A bee-keeper of some years' experience admitted to me not long ago that the only kind of honey she could positively distinguish by the flavor was that from sweet clover.

Heart's-ease honey has one serious fault. It is injured more easily, and to a greater extent, by overheating than any other kind I am acquainted with. The heat of boiling water, if the whole mass is heated up to that point, will utterly ruin it, giving it a flavor and odor that reminds me of an infusion of hay. Unless consumers are made aware of this fact, unpleasant results may follow. It will be seen that it is not fit for cooking purposes, as the "hay tea" flavor is not generally liked. The nectar from heart's-ease seems thicker than that from most plants. This was particularly the case last season, when it seemed ready to cap over almost as soon as it was brought in. On this account I do not think it as profitable in the extracted form as in comb.

As to the relative profit of producing comb or extracted honey, I would refer my correspondent to my article on the subject on page 691 of *GLEANINGS* for 1887. No one can be certain, until he tries it, which will pay him best; but in the majority of cases, comb honey will be found more profitable. With regard to the rest of the letter, commission men generally charge 5 per cent on sales, though in some places 10 per cent is charged. If my correspondent makes a success of moving his bees, especially for the basswood flow, I hope he will report on it. We do not know nearly as much on the subject as we ought to. I believe it is destined to play an important part in the bee-keeping of the future.

HONEY IN PAPER PACKAGES.

You will remember the article I wrote on small paper packages for extracted honey. I send you some of these by this mail. The honey is not very good in quality, being a mixture of various sorts, and the paper in which it is wrapped is simply *GLEANINGS* paper. I hope it will reach you without damage. It seems to me that something might

be done in this way to furnish a market for a great deal of honey.

J. A. GREEN.

Dayton, Ill., Mar. 9, 1889.

The candied honey in little packages looks very pretty, only it is somewhat sticky. This may be remedied, however, by wrapping it up in paraffine paper, exactly as we get caramels from the confectioner's. I presume a very choice grade of honey would sell well as confectionery, but it would be considerable trouble and expense to put it up in these packages; and if a trade is once started it will be greatly crippled or perhaps killed by using an inferior article. If I am correct, some honey candies in a good deal better shape than others. Small packages, say one inch square or less, would probably keep their shape, and be neat to handle. If not sold immediately, however, I am a little afraid that it would look old and uninviting.

MANIPULATING CHAFF HIVES, AND PREVENTING SECOND SWARMS.

GEO. E. HILTON GIVES A FEW FACTS IN FAVOR OF CHAFF AROUND THE BROOD-NEST.

THE great bugbear held up against chaff hives is their weight in manipulation. Having always used chaff hives I have learned it is unnecessary to move them after they are once placed upon their stands, which (i. e., the stands) should be substantial. For this purpose I like a rim made of 2 x 4 oak, or some timber that does not rot easily. When the chaff hives are once on their stands they certainly possess advantages that the single-walled hives do not. Bees will certainly build up faster upon less stores in the spring, and are less liable to spring dwindling. When the heat of summer comes on, your surplus receptacles are better protected from the scorching sun without the use of shade-boards; the brood-nest is more comfortable, and when bees in single-walled hives are lying out and doing nothing for fear of melting their combs, bees in chaff hives are busily at work; and I have yet to have the first comb break down in them.

In manipulating the surplus there is less stooping, and, as a consequence, less backache; and with both kinds in the yard for the past ten years, I have received enough more honey from the chaff hive to pay for their extra cost. They are always ready for winter by simply putting on a chaff cushion when you remove your surplus crates in the fall. There is less swarming than in the single-walled hives, for the same reason that they work when those in the single-walled hives do not. They are more successfully handled against second swarming. When a swarm issues I lift off the surplus cases and set them on top of the next hive, lift out 7 of the 8 frames, and place them with the adhering bees in an empty hive. I then put in seven frames of foundation (in the parent hive), replace my surplus cases, and by this time the swarm has clustered. I next shake what I can of the swarm into my hiving-basket, invariably getting the queen the first time, and then dump them upon the alighting-board, and the work is done. As the remaining bees will soon return to the parent hive, and all the field bees giving you the same working force as before, with energies redoubled, look out for your surplus room, for the queen will occupy

the foundation as fast as drawn. Your seven frames are so depleted (with yet enough bees to care for the brood) that they will not swarm one time in ten, and your honey will all come from the parent hive, and you will have fewer unfinished sections, unless you get a fall flow, as we did the past season when I had to extract the brood-nests to give the young queens room to lay. In my locality I save all the first swarms up to Aug. 1, and have never yet failed to have them in good condition for winter.

When I read of some of the methods used in manipulating the single-walled hives in securing honey, and in the prevention of second swarms, I fear that I should need a book-keeper to keep things straight. With me it is all done at one operation, and I have no further thoughts in the matter. It is a success, both in the production of honey and the prevention of second swarms.

Fremont, Mich.

GEO. E. HILTON.

Why, friend H., it seems to me a little funny to have you indorse the chaff hive in the vehement way in which you do. Your ideas are mine exactly when I invented our present method of making chaff hives; and my experience in all these years agrees exactly with yours. Now, it seems to me that those who have been so vehement—yes, and I might almost say *bitter*—in denouncing the chaff hive should remember there are quite a few who think just as you and I do. Some have objected to the chaff hive because it is inconvenient for handling the combs; and it surprised me when I heard it, for I find the chaff hive the most convenient, even for queen-rearing, of any hive I ever had any thing to do with; and it is because I can lean against it when handling the combs, and support myself without pushing it over or off its foundation. When working with the Simplicity hives I am obliged to lean over the hive and work in a leaning position, without any thing to support me; and I have always found that, when I go from a Simplicity hive to a chaff hive, especially when I am tired, that the chaff hive rests me just because I can lean my whole weight against it while I lift out the combs; and I want the old-fashioned two-story chaff hive, just as I first made it. In your method of working you do not say what you do with the combs and adhering bees that you lifted out; but I suppose they are taken away to make another colony. We have not found this very good economy unless we get some working bees from some other new swarm to put with them; otherwise there will not be any pollen or honey brought from the fields for nearly a week.

THWARTING ROBBERS.

ALSO SOMETHING ABOUT THE SIZE OF THE BROOD-CHAMBER.

LAST August I received a letter from H. L. Jeffrey, of New Milford, Conn., in which he said, "I must send you a trick that I have tried many times at this season of the year, or I should say this time of honey-dearth. Several years ago I was handling a stock that was being robbed. The bottom-board to the hive projected about 4 or 5 inches in front. The stock was

quite demoralized, and were all over the ground, and the robbers were going in and coming out like mad demons. I looked at them for a moment, then around, and, seeing some sticks half an inch thick, and a shingle about 6 inches wide that had been used over the combs the previous winter, I just put the half-inch sticks at each end of the alighting-board, then the shingle on top, and pushed it tight to the front of the hive; and, wasn't it fun to see those robbers try to go through the front of the hive? the robbers inside coming out from under the shingle, and unable to find their way back, and at the same time the demoralized bees belonging to the hive were quietly crawling back and leisurely walking under the shingle, as cool as though enjoying the sight of the acrobatic exercise their defeated plunderers were taking."

Mr. Jeffrey found the plan to work equally well in subsequent trials. I was so unfortunate (or, rather, so fortunate) as to have no case of robbing last season after getting his letter; but from the well-known habits of bees, I think the plan well worth trying, even if Mr. Jeffrey's long experience did not give me confidence in his decision. The whole affair is very simple. The entrance from the outside is closed, and a new entrance made, while the exit remains practically unchanged. The robbers remain, frantically attempting to force an entrance at the one spot, while the bees belonging to the hive are more inclined to hunt for another entrance.

HIVE FOR COMB HONEY.

A correspondent writes: "Please answer through GLEANINGS what size of frame, size of super inside, and size of hive inside, also how many frames to hive, and what size of section you would use if you were going to adopt a hive for comb honey. Would you want it larger for extracted honey if two stories are used?"

The frame I am now using and have been using for a good many years is 18 x 9. I do not know that any different size would give better results, although it must be remembered that for a long time I have used no other size, and am likely to be prejudiced. I would not adopt that size, however, if I were beginning anew, for the simple reason that I don't want a size different from every one's else, unless there is strong reason for it. The size of the Simplicity-Langstroth frame is only $\frac{3}{8}$ inch shorter and $\frac{1}{8}$ inch deeper—so nearly the same that, for practical purposes, there is no difference, and so I should prefer that which is used by many others, instead of having an odd size. I think I should prefer a hive to take eight of these frames, thus making a hive 18 inches long and 11½ inches wide, inside measure. I would use the common 1-lb. section, 4¼ x 4¼, to go in a T super measuring inside 17½ x 12½ x 4½.

I am not authority on extracted honey, but I do not think I would have a different size of hive, if I expected to use some hives for comb and some for extracted. If, however, I intended to raise no comb honey, but extracted altogether, I should do some pretty heavy studying or experimenting to see if a ten-frame hive might not be best.

Marengo, Ill.

C. C. MILLER.

The idea of a shingle or other thin board, supported on narrow strips over the entrance, is quite old, and a pane of glass in place of the shingle seems to answer still better. If robbers are acting very bad, the

shingle would have to be fastened down with small nails; but an ordinary pane of glass has weight enough to keep its place. I think that prevention in case of robbing is much better than cure; but after they do get to going, the idea is often valuable. It is my opinion that such cases of robbing have more to do with bees being voted a nuisance in a neighborhood than any other one thing.

HEADS OF GRAIN FROM DIFFERENT FIELDS.

EARLY HATCHING.

MY bees are situated on a western exposure of a hill. March 17th they carried in the first natural pollen that we could see. One colony was not carrying pollen. Concluding that that colony was queenless, I opened the hive and found neither brood, larvæ, nor eggs. I then searched for the queen, and found a young one, white as a corpse, certainly not five minutes old. I pushed aside the little cluster of bees where she was, and found two capped queen-cells, and one with its "coffee-pot lid" open where the young queen had just come out. I watched her a few minutes, when she dipped her nose into a cell and started out over the comb. About the queen-cells I found two or three cells of capped brood. Apparently the old queen had just lived until about March 1st, then laid six or seven eggs, and died. As there are no drones flying, and the weather is very bad, I think the chances are against this queen being fertilized, and I shall lose the colony, as it is too weak to raise a new queen from eggs in April. At least, I fear it is too weak to raise good queens. I think St. Patrick's Day in the afternoon is rather early for young queens in this latitude.

PHILO S. DILWORTH.

Bonney, Pa., March 21, 1889.

SORGHUM MOLASSES TO FEED BEES IN SPRING.

Please tell me whether sorghum molasses or syrup is fit to feed bees in the spring. Of course, I know it would be unsafe to give it in the fall for winter supplies, but I thought it might be good in the spring to feed up to stimulate queens, etc.

Worthington, Ind., Feb. 5, 1889. J. A. MINICH.

Sorghum molasses will do for spring feeding whenever the bees fly freely; that is, providing the bees will pay any attention to it. Unless the quality of the sorghum is quite good, and no honey of any sort is to be had in the fields, bees will seldom work on it. During a drouth in the fall, when we are keeping nuclei going for the purpose of raising queens, sorghum molasses will often answer a very good purpose. It is so distasteful to bees that they seldom care enough for it to start robbing, and in this respect it is much better than honey.

THE NON-REVERSING EXTRACTOR, AND WHAT MR. COWAN SAYS ABOUT IT.

We take pleasure in making the following extract from a private letter received from our brother-editor, Mr. Thos. Wm. Cowan, of the *British Bee Journal*, relative to the non-reversing extractor mentioned and described on pages 683 and 773 for 1888:

I was interested in your taking up the honey-extractor to extract from both sides at one operation. I have been looking forward to remarks from others. The diagram of one you have made is very nearly exactly the same as the one I made and used, and was described in the *British Bee Journal*. If you like I will send you the extract referring to it. The reason I gave it up at that time was because the combs got damaged unless great care was taken, and it was not safe to put it into the hands of careless people. You know we did not have wired frames, and new combs heavy with honey used to become crushed up toward the top-bar, which was on the outside circle, and toward which the centrifugal force pressed them. With old combs, such a thing would not happen. Otherwise the honey was extracted without any difficulty. This extractor is still in existence, and is in the collection of appliances I presented to the British Beekeepers' Association.

THOS. WM. COWAN.

Boulevard Grancy, Lausanne, Switz., Dec. 22, 1888.

ARE BLACKS MORE HARDY THAN ITALIANS?

Which are the best bees to winter, in your opinion? My gray bees are wintering all right. The hives are just full of bees, but the Italians are all dying. A week ago to-day my bees had a good fly, and the Italians would crawl out and get a chill and die.

Deshler, O., Feb. 23, 1889.

T. OBERHITNER.

As a rule, blacks are not more hardy than Italians. The two races of bees, however, are so different in their habits that it is not unfrequent to find one wintering better than the other. For instance, while the blacks are working on buckwheat, the Italians will often be working on red clover; and in this case the difference in the kind of stores might make a difference in wintering. Italians will also sometimes work on honey-dew while the blacks will not, and I should think likely that that is the trouble in your case. Warm weather, that will enable the Italians to fly, will probably fetch them up all right.

HOW TO MAKE A START IN BEE-KEEPING.

I want to get started in the bee-business again, on a very small scale. A number of years ago I bought your A B C and got two hives of bees; but the bees and my bright hopes, one by one, took flight and left me "weeping sad and lonely." There are only black bees around here, and the owners ask \$7.00 per hive for them. But I have not that much to throw away, as my John says. We have all kinds of fruit, large and small, which our neighbors' bees thrive on from the first cherry blossom in May till the last raspberry in August. If I must gather bees by the handful while picking raspberries, I am quite sure that I could do it with greater equanimity if I knew that some of them were my own. Your advice in the A B C is to get two or three pounds of black bees and a fertilized Italian queen. Is that still your advice? If so, I can get the black bees here.

MRS. C. H. TARBELL.

Bedford, N. H., Mar. 12, 1889.

Yes, my friend, that is still our advice. Almost everybody can get bees of some sort near home; and all you have to do is to get such a queen as you want, by mail; and queens are carried by mail safer and quicker than hives of bees, even by express.

WASTE FELT VS. CHAFF, FOR PACKING.

Friend Root:—I want to talk to you a little more in reference to the sample of packing I sent you, in hopes it may be of some benefit to some bee-keeper in this vicinity and other places where fur-hat factories are easily accessible. You reply, the great objection to it is the expense, and on that account you prefer chaff, especially wheat chaff. In this locality we can't get wheat chaff, as comparatively no wheat is raised in this vicinity, and the best chaff we can procure is oat chaff, which I have always used until the last one or two seasons. But after using this waste—like sample sent you—I think it much superior; and the only objection I have to it is, that the fur and hair stick to the clothes, and it is quite a bother to get it off. As far as the expense is concerned, it costs no more than chaff. It is the waste from the shaving machine, use in the manufacture of fur hats, and is composed of fur and hair. Now, if any bee-keeper in the vicinity of a fur-hat factory will go to the factory and get this waste to pack his bees in, I am sure he would decide with me that it far excels chaff. It costs nothing. The manufacturers are generally glad to have it taken away. S. H. HICKOK.

Bethel, Conn., Feb. 9, 1889.

We have no doubt, friend H., but that the waste from hat-factories will answer as well as chaff; but the great objection to it is, that there are very few bee-keepers indeed who are so situated as you are, to get this kind of packing; and the number of bee-keepers who can not get some sort of chaff is comparatively small.

THE WORK OF MICE IN THE HIVES.

I went into the winter with 16 colonies, after uniting and giving, as I supposed, plenty of stores to carry them through; but I find I am taken right back where I was one year ago, as I have nine colonies left to date, all very strong and fair. We are told in the A B C that mice are enemies of bees. We try to guard against them, but mice had been in no less than five colonies of the 7 lost—the first time that a mouse ever got into a colony of my bees. You see, the entrances get large by the action of the weather, and the passing of the bees in and out. That thing will never occur again with me; however, I think on the whole more stores have been required to bring bees thus far than any other winter since I have had bees.

Hinckley, O., Mar. 15, 1889.

A. A. WEBBER.

THE WARNER PARALLEL GAUGE; QUESTIONS CONCERNING IT.

Are the rods or screws of Warner's improvement to saw-tables, for regulating the gauge, long enough so that the gauge can be set as much as two feet from the saw with a gauge $3\frac{1}{2}$ inches wide, or how long are they? I often use the parallel gauge to cut off with, and want to cut my bottom-boards two feet long; does this attachment still work well? Do you still sell them, and at what price?

Le Sueur Center, Minn.

R. KENDALL.

Friend K., the screws in the Warner parallel gauge, such as we send out, are 26 inches long. The gauge itself can be set 24 inches from the saw; but if so arranged it will not come near enough to saw sections, brood-frames, or other thin stuff, without putting a straight piece of plank of suitable width on the face side of the gauge. On our

regular section saw-tables, such as we use in our factory, the screws are shorter. When so arranged, the gauge can come in contact with the saw itself, if necessary, or be set back 22 inches. The Warner parallel bar and screw attachment is the best arrangement of the kind we have ever used. A few quick jerks of the chain will cause the gauge to be set at any point. One of its chief merits is, that it can be adjusted to a hair's breadth, if not *exactly* at the point desired. With the old parallel gauge it was very difficult to get an exact adjustment. We use these screw gauges in our factory exclusively now. We sell them with screw, chain, and every thing complete, for \$5.00.

TO INCREASE THE SIZE OF WORKERS BY INCREASED SIZE OF CELLS NOT A SUCCESS.

Some time since there was a good deal of discussion as to whether we could not increase the size of worker bees by making comb foundation a little larger than the regular size. Last spring in looking over my hives I found in one of them that had a good deal of drone comb a queen (I have had them before that would not lay a drone egg nor make any preparations to swarm during the swarming season) that had not laid a drone egg; but being pressed for room she had filled three drone combs with worker brood—no mistake; 30 years in handling bees has made me familiar with the difference between a worker and a drone. Those workers were no larger for being raised in drone-cells.

HOW TO MAKE SMOKER-LIGHTERS.

A great convenience in the apiary, is rolling up paper balls the size of marbles, putting about an inch of oil in, in a quart can, filling it up with the paper marbles, and you have the best and quickest lighters for your smokers that you can possibly have; by making them the size of a large egg, you have a good one for the kitchen stove. A Mr. Wilson said to me a few days ago that you can clean your smoker of soot very easily if you put some salt on the fire which you make to clean it.

Los Gatos, Cal.

S. S. BUTLER.

You are right about the matter of enlarging bees by giving them larger cells. Facts similar to those you have given have been sent in repeatedly; but for all that, every little while somebody invents over again the idea of enlarging the cells.

EXCLUSIVE TERRITORY. OVERSTOCKING, AND WHO IS TO BLAME FOR IT?

I fear my article on "exclusive territory" is not quite understood by the readers of GLEANINGS. Numerous propositions have been made from time to time by different people to secure exclusive territory by legislation. I was bitterly opposed to any law that would work injustice to the poor, therefore I wrote my article on "exclusive territory." I said the only fair way to secure such rights was by purchase, rather than by legislation. I do not believe in monopoly of any kind, where it will operate against the poor, not even patent bee-hives. Personally I have no faith in the feasibility or advisability of exclusive territory. I think it would be cheaper to move to a location where there are not so many bees than to try to buy out the neighborhood. Bee-keepers are themselves much to blame for the overstocking of some locations. A man gets a new variety of chickens, and he makes

haste to sell hatching eggs to all his neighbors at "two dollars a sitting." Before he is well aware of it he finds everybody crowded with that kind of chickens and he himself trying to trade his fine eggs at nine cents a dozen to the village grocer for molasses and stale cheese. Just so in the bee-business. A man gets a few bees, and hastens to advertise "Bees and Queens for Sale." He discounts his future profits for present benefits, and shortly finds all his neighbors in the bee-business, the locality overstocked, and his honey begging for a market.

PHILO S. DILWORTH.

Pittsburgh, Pa., March 5, 1889.

I also am opposed to any monopoly that works injustice to the poor, and I also believe that the way to secure exclusive territory is to make a contract with your neighbors not to keep bees if you can do so; and I still think that, in many neighborhoods, this can be accomplished. If we are going to raise forage for bees, and have a honey-farm, it would be of the utmost importance that the adjoining farms should agree not to keep bees. Why can't it be managed as well as they manage the matter of making leases when drilling for gas and oil? Before men go to the expense of sinking a well, they very carefully lease the land adjoining, so as to have the control of the locality in case it should be found to be a valuable one. Now, while it is true that the man who gets a new kind of poultry may stock the neighborhood until he runs the price down, I think great good comes from this kind of work, many times, without getting the price down, or, if you choose, *before* the price gets down. Surely it is better to buy choice stock of any kind of your *neighbors* than to send away off to a distance, pay heavy express charges, and then get something you have not seen before handing over your money. In the same way I believe it pays most bee-keepers to advertise bees and queens for sale. Now, none of you need accuse me of saying the above from selfish interests, because I have just advised very strongly trading with your neighbors instead of sending away off to a distance; and I do think that bees and queens had very much better be bought near your own home, than to send away off, take the risks of heavy charges, damage in transportation, and may be getting foul brood besides. When it is impossible to get what you really need, in your own neighborhood, why, then, of course, you can call in the aid of the express and freight companies.

HOUSE-FLIES, AGAIN.

A subscriber from Ohio says he finds myriads of flies in his horse manure in winter. He says that, as the eggs were laid last summer, drawing the manure out in winter would freeze out the insects. This is not true. The house-fly hibernates in winter—this is genuine hibernation; so eggs will be laid next spring. This explains why flies are scarce in early spring and summer. They breed rapidly, and become very numerous by fall. The same subscriber says: A neighbor drew out all his manure in winter. Soon his manure heap was full of house-flies, yet all was made in the last two weeks. An explanation is asked for. I answer, there is some mistake. House-flies do not breed in

winter, and all insects come from eggs; thus if flies were seen they came from eggs laid last autumn. Hence either the manure was not drawn out clean, or else some old manure, or rubbish with eggs, was thrown out with the manure. Flies do not lay eggs in winter, in the North. All insects come from eggs. Any observations that seem to contradict these statements need to be repeated.

Agricultural College, Mich.

A. J. COOK.

I think your explanation is correct, friend Cook. When our friend wrote me, it did not occur to me that the eggs laid by flies might remain several weeks or months, until the temperature was right. If this is so, it will account for the presence of larvæ in the manure, which I presume has been observed by many, even during the winter time.

THAT QUEEN OF MRS. CHADDOCK'S UNDER A GOBLET; DOES A SWARM EVER ABSCOND WITHOUT THE QUEEN?

Friend Root:—I think Mahala B. Chaddock owes a word of explanation in regard to what she says on page 89 about 4 swarms of bees going to the woods, and leaving their queens under a goblet on a plate. Now, does she mean that those bees went off without any queen, and set up housekeeping in the woods, without any queen? If she does, then she has "downed" Langstroth, Quinby, and A. I. Root as effectually as she did A. J. Cook in regard to the color and scent of flowers. These fathers of apiculture have taught the young American that no swarm of bees will leave without the queen, and my experience has proved the correctness of their theory. Now, if sister C. has made the discovery that a swarm of bees will abscond without a queen, what is the use of clipping the wing to prevent absconding? or did the bees know that the queen's wing was not clipped, and the good woman of the house had her under a glass goblet, and that she would let her go in a few days, and that she would follow them to their new home, and by that time they would have house-cleaning done ready to receive her ladyship?

The way I keep the bees from putting propolis in the beveled joints is not to have any beveled joints, but use a hive with square joints, like the old-style Heddon hive, thereby obviating the use of tallow, chisel, and hatchet; but if I had bevel-joint hives to sell I might recommend the use of tallow and oil to prevent the bees from gluing them together.

Sherman, Ill., Feb. 6, 1889.

D. D. COPER.

Friend C., we *did not* understand Mrs. Chaddock to say that four swarms went off to the woods, leaving their queens under a goblet. No doubt one of the queens was under the goblet; but the other three ought to answer for even four swarms—that is, if they went to the woods *en masse*. Mrs. Chaddock did not make her point very clear about the four swarms that went to the woods.—Your last sentence, it seems to me, makes out that you are a "badder man" than bee-keepers in general. I know there are some men who would sell a thing that they knew was worthless, and a hindrance to their fellows, if they could make money by it. Surely there are not many such among the readers of GLEANINGS; and I do not believe there are many who believe the *editor* would set the example. We furnish

any kind of hive that anybody wants; and we sometimes make Simplicity hives with square joints instead of beveled ones, where the brethren think they prefer them that way. But 100 of our customers prefer them with the bevels, where one asks to have them square. Bee-hives without the bevels were the rule before the Simplicity was invented, and they are to be found even yet, more or less, in almost every apiary. Langstroth, you will remember, adopted the plan of having the upper story slip over the lower one in order to keep out the wind and rain, and to keep the upper story in its place. I thought this took too much lumber, and, besides, I objected to hives with projections. When I used Langstroth hives exclusively, I could get only *three* hives of bees into my one-horse wagon. The portico stuck out in the way, the rim around the outer edges stuck out in the way, the upper story stuck out in the way, and the covers also stuck out in the way, and got bumped loose, letting the bees out to sting my horse. After I invented the Simplicity I could set *eight* hives of bees in my one-horse wagon and take them to a buckwheat field, without the top stories slipping off from the lower ones, or the covers getting slipped off or bumped off. When I wanted to pile my empty hives up under shelter, the Simplificties could be placed one on top of the other, covers, bottom-boards, and all, clear up to the ceiling. The next tier would go up tight against it, so that it was very much like putting the hives in the wagon. A certain size of room that would hold only eight or ten Langstroth hives would hold twenty or thirty Simplificties. Now, if anybody wants to go back to the old style—if they want hives without the bevels, or even if they want box hives, we shall be glad to serve them.

DOES WILLOW PRODUCE HONEY?

I have ten colonies of bees in chaff hives of my own make. One colony made 96 lbs. of comb honey last summer. I should like to know for certain whether yellow willow produces honey. I have watched the bees at work on them, but never saw them get any pollen. I think this is conclusive evidence they get honey; and by the way they worked I think they were getting it in pretty large quantities. Would it pay those living by streams of water to set out some branches? They would save the banks, and give the bees work.

W. A. WILLIAMSON.

Friendly, W. Va., Feb. 11, 1889.

Your evidence seems pretty clear, friend W., that bees do get honey from the willow. In our vicinity, willow hedges were put out, perhaps 25 years ago, to a considerable extent. During favorable seasons bees do sometimes work considerably on these willows; but as a rule I think they amount to but little. Perhaps this is because they are not of the variety that yields honey most.

BEES IN TOWN.

I have been taking GLEANINGS for three years. I can hardly do without it. I am a beginner with bees. I had good luck with them, but did not get much honey last year, on account of dry weather. I put away 28 colonies in winter quarters, under a

shed, and filled in with sawdust. The weather has been very warm here. We have had no cold weather as yet. I live in a town of about 30,000 inhabitants.

B. M. HUBLE.

Wallaceburg, Ont., Can.

Bees do very well in town; in fact, a great many bee-keepers have their colonies inside of the corporation limits. Occasionally there is trouble with neighbors; but usually it is a case of ill will from other causes. Most of such troubles can be avoided by occasionally presenting your neighbor with a nice sample of honey.

REPORTS ENCOURAGING.

ENCOURAGING FROM A. E. MANUM.

BEES in this section of the State are, we think, wintering nicely, as the winter has been very mild for this climate. They had a very fine clearing flight on Jan. 17th and 18th, and also March 5th and 6th. On the 6th I opened a few hives and found, to my great delight, that but very little of their stores had been consumed, and the bees appeared to be in a healthy condition, with but a few dead bees on the bottom-board. We are very hopeful that this coming season will prove to be one of our old-time honey seasons, as clover made a very fine growth last fall, also the bass-woods made an excellent growth of new wood during last summer, which indicates a full bloom the coming season.

A. E. MANUM.

Bristol, Vt., Mar. 14, 1889.

55 GALLONS OF CHUNK HONEY FROM 11 COLONIES.

I bought a place in this county, and moved to it in the fall of 1887, and with the place I got a few hives (9, I believe) of hybrid bees, in a bad condition, "robbed almost to death," including the spring swarms. After the last winter "starve outs" I have 11 hives, mostly Simplicity. I did not have time to work with them much, nor the foundation to straighten their combs; and having sold my tractor before moving, I decided to "let 'em rip." I did not weigh the honey, but the vessel's capacity that it filled was 55 gallons, "chunk honey," as the A B C would call it. My bees went into winter with plenty of stores, and are now rearing brood very nicely.

W. M. WOOLSEY.

Floresville, Tex., Mar. 2, 1889.

LARGE VERSUS SMALL HIVES; \$1600 AS THE CASH PRODUCT FOR ONE SEASON.

I have 260 colonies, in hives containing 800 inches of comb surface. I use two of them for a hive, and have managed for the last eight years on exactly the plan that Dr. Tinker generously offered to give free to the bee-keepers, in the *American Bee Journal* lately. I like the plan, and secured seven tons of comb honey by it this poor year. I cashed it long ago for \$1600. I know that, with the hives and system I now use, the best results are reached with one-half the work in summer management, as compared with the common hives and system. I am wintering 260 swarms in two apiaries.

B. TAYLOR.

Forestville, Minn., Feb. 5, 1889.

First swarm of the season came out Feb. 15th.

Sara Sota, Fla., Feb. 17, 1889.

S. C. CORWIN.

From 4 stands in the spring, I increased to 30, and secured surplus in sections, 1000 lbs.

Edina, Mo., Mar. 12, 1889.

J. M. LONG.

I had 13 hives, spring count; increased to 22; extracted 100 gallons of honey; sold it at 75 cents per gallon.

S. C. CUHARD.

Luling, Tex., Jan. 18, 1889.

FROM 19 TO 44; 13 QUEENS AND 840 LBS. OF HONEY SOLD.

In 1888 I commenced in the spring with 19, and increased to 44, fall count. I sold 13 queens, and took 840 lbs. of honey.

J. W. TAYLOR.

Ozan, Ark., Jan. 13, 1889.

FROM 26 TO 48, AND 5100 LBS. OF HONEY.

My account with the bees for 1888 is as follows: I started in the spring with 26 colonies; increased them to 48, and obtained 5100 lbs. of honey—1400 lbs. comb, and 3700 of extracted.

Salt Lake City, Utah.

WM. G. ADAMSON.

3850 LBS. OF HONEY FROM 50 COLONIES, SPRING COUNT.

During 1888 we secured from 50 colonies, spring count, 3850 lbs. of comb honey—an average per colony of 77 lbs.

JOHN AND JAMES COWE.

Goodland, Mich., March 7, 1889.

PROSPECTS GOOD; FROM 18 TO 22, AND 1000 LBS. OF HONEY.

I commenced the season with 18 stands of bees; increased to 22, and obtained 1000 lbs. of comb honey in 1-lb. sections.

J. B. RIGGENS.

Swanton, Neb., Feb. 18, 1889.

A POOR SEASON, BUT 3000 LBS.

Last year was not very favorable. I got 3000 lbs. of honey this year. I am wintering 100 swarms in a cave. Thus far it has been very warm in the cellar. It is colder and snowing to-day. Thirty colonies are out of doors.

T. KOULO.

Portville, N. Y.

WINTERED WELL, AND GATHERING POLLEN.

My bees wintered very well on winter stands. The majority of the hives are full of bees, and they have all been gathering pollen for the last three days, from black elder. I have 25 colonies, all in good condition.

S. YINGST.

Sydney, Pa., Mar. 18, 1889.

ENCOURAGING FOR CALIFORNIA—SEE PAGE 207.

I have just finished trimming and plowing my orchard. The peach-trees are commencing to bloom, and the oranges are getting nice and ripe. I noticed the bees bringing in pollen to-day, and the queens commencing to lay. So far we have had 11 inches of rain, and the grass and weeds are growing very fast. We must have an abundance of both early and late rains, however, to insure a good honey crop.

J. F. MCINTYRE.

Fillmore, Cal., Jan. 7, 1889.

THE FIRST POLLEN.

How pleasing to the eye and ear to witness the return of the first pollen-laden bees of the season! How eagerly they rush out, and how business-like they march in, after reaching the alighting-board! Such a sight I had the pleasure of witnessing to-day. My 100 colonies have all wintered, and are in good shape, but are rather short of stores, the mild winter being the cause of a greater consumption of stores than usual.

W. H. LAWS.

Lavaca, Ark., Feb. 14, 1889.

NOTES AND QUERIES.

We solicit for this department short items and questions of a practical nature; but all QUESTIONS, if accompanied by other matter, must be put upon a SEPARATE slip of paper with name and address.

BEES DYING OFF IN EARLY SPRING.

I HAVE 3 hives of bees, and on warm days the bees come out in big lots, and die. What can I do for them?

JAMES M. SMITH.

Perkiomenville, Pa., Mar. 4, 1889.

[Those bees which fly out and do not return are probably old bees. They probably would not be of very much service to the colony any way, and would likely die in the hives if not outdoors before actual weather comes on. Apiarists generally calculate on having some of these old bees, at least, die early in the spring. They will accumulate on the bottom-board if the colony is in the cellar, or will fly out on the first sunny day if on their summer stands packed in chaff.]

WHY WE DISPENSE WITH THE TIN RABBIT IN THE DOVETAILED HIVE.

I like your dovetailed hive, as shown in GLEANINGS for Mar. 1, but I don't understand why you do not use the tin strip, or rabbit, for frames to rest upon, as it renders the manipulation of the frames much more rapid.

R. Q. KING.

Springfield, O., Mar. 6, 1889.

[Because the majority of the honey-producers, those who are extensive bee-keepers, prefer to dispense with the tin rabbit, for the very reason that the latter allow the frames to shuck about too much in transportation from one out-apiary to another. Hives having frames resting on wood bearings require no special provision to hold the frames in moving. See Question-Box, this issue.]

WHAT IS A FAIR COMMISSION FOR SELLING HONEY?

I am starting a home market for selling my honey. Most of the groceries in this town sell it for me. I furnish every thing, show-cases and paper-boxes, stands, and cases for extracted honey, and all they have to do is to sell it out. Now, the question is, what per cent do you think is right to allow the grocers for selling it for me?

MRS. W. G. TITTSWORTH.

Avoca, Ia., March 3, 1889.

[Under the circumstances I think that 5 or 10 per cent would be all your groceryman should charge; but friend Heddon and some others have suggested that grocerymen will work much harder to make sales, and to work honey off, where they have from 20 to 25 per cent, than where they get only from 5 to 10.]

CAN CHLOROFORM BE USED SAFELY ON BEES?

I lately read an article, saying that chloroform might be used with safety in quieting bees, when handling them; but I thought best to refer to you before making the attempt; and as I presume other readers of GLEANINGS would like your opinion, would you please give it through the columns of your excellent magazine?

MRS. S. ALLCOCK.

Ashtabula, O., Mar. 12, 1889.

[Bees can be chloroformed so that they will fall down on the bottom-board, or stick to the combs, apparently dead. The idea is very old; but I believe that one after another who have tried it have decided they would much rather have live bees to manipulate than dead ones. Smoke is very much handier and cheaper, and at the same time accomplishes the purpose far better than chloroform.]

61 BUSHELS OF JAPANESE BUCKWHEAT FROM 24 LBS. OF SEED.

I bought a bushel of Japanese buckwheat of you last spring; sold half of it to a neighbor, and sowed the remainder, just 24 lbs. It made a wonderful growth of straw, and was, without exception, the

nicest field of grain I ever saw. Bees did not work on it to any profit, and the seasons are far between that buckwheat amounts to much in this vicinity, for honey. The frost came early, damaging the crop of grain at least one-third. I harvested 61½ bushels, heaping measure at that.

Norwich, N. Y. W. B. NORTON.

THE TARANTULA A GREAT JUMPER.

In GLEANINGS, p. 123, is a drawing of a tarantula. There are some here at least twice as large as the drawing (it may have dried and shrunk before it was received by Prof. Cook), but these will attack any one who molests them. I have seen them jump twelve or fifteen inches high, and eighteen to twenty inches in a single jump; and I believe Prof. Cook would think there was danger when one would jump several times after him and clear eighteen inches each jump.

S. H. COLWICK.

Norse, Tex., Feb. 26, 1889.

WOULDN'T STAY IN THEIR NEW HOME.

I bought a swarm of bees from a tree last summer, and brought them home and divided them and put one part in one small hive of Italians, and the other half in another stronger colony. The last half contained the queen from the tree. I supposed the Italians would kill the black queen, but they stayed in the hive until after 12 o'clock, then every black bee came out and ran away with their queen.

H. J. HANCOCK.

Siloam Springs, Ark., Feb. 22, 1889.

[It is never safe to presume that the bees will kill one of the queens, for they quite often behave just as you have described.]

OUR QUESTION-BOX,

With Replies from our best Authorities on Bees.

All queries sent in for this department should be briefly stated, and free from any possible ambiguity. The question or questions should be written upon a separate slip of paper and marked, "For Our Question-Box."

QUESTION 115.—a. *If you were obliged to keep the same number of brood-frames in a hive the year round, how many L. frames would you use in working for comb honey?* b. *For extracted?*

b. 24.

R. WILKIN.

Eight.

H. R. BOARDMAN.

a. Seven; b. ten.

G. M. DOOLITTLE.

Eight; sixteen.

A. J. COOK.

a, b. Eight frames.

GEO. GRIMM.

a. Eight; b. nine.

MRS. L. HARRISON.

I use ten for both.

P. L. VIALON.

a. Eight; b. ten in the lower story.

O. O. POPPLETON.

Seven for comb honey and sixteen for extracted.

E. E. HASTY.

Not less than ten, both for extracted or comb. We prefer 11 or 12.

DADANT & SON.

I believe I would use ten for either comb or extracted honey.

A. B. MASON.

With my present knowledge I am inclined to think a. eight; b. ten.

C. C. MILLER.

For comb 8, and winter in the cellar. For extracted 24, and winter outdoors (on 16).

E. FRANCE.

If I were obliged to start anew, and to use L.

frames, I would make all hives to hold eight frames. For extracted honey alone, I would a little rather use ten frames.

JAMES A. GREEN.

a. If I were using the kind of hive in which I was obliged to retain the same number of frames continually, I should like it to hold the equivalent of about seven of our 10½x16 frames. b. I wouldn't consent to any such arrangement for extracted honey.

P. H. ELWOOD.

For boxing, 9. If the question means that no other combs are to be used for surplus in extracting, I would not advise trying to secure extracted honey, as more box honey could be secured than one could expect of extracted. If surplus combs are to be added by tiering up, I would use the same number in both cases.

L. C. ROOT.

If I were obliged, I would keep 10 frames in the brood-chamber, no difference if my object were comb or extracted honey, because from a large brood-chamber I expect a large colony, more honey, and fewer swarms; while from a small brood-chamber, only a small colony can be expected, less honey and more swarms. If I should keep a certain number of frames all the year round, my standing as a bee-keeper would not be above the level of an old fogey.

C. F. MUTH.

Should not your question read, "Brood-frames in the brood-chamber" instead of "in the hive"? The hive combines the whole arrangement, both brood and surplus departments. In the brood-chamber I would use just eight L. frames, no more and no less. I speak assuredly on this subject, for I have given it very extensive tests on a large scale, the question being a hobby of mine for years. There are advantages in having a large brood-chamber, but there are also disadvantages, which amount to more than the advantages, unless the brood-chamber is horizontally divisible. I speak for both comb and extracted honey, and of the brood-chamber strictly.

JAMES HEDDON.

I suppose the above question was intended to call forth opinions in regard to the matter of a hive made wide enough to hold eight or ten frames. Father Langstroth decided on ten; but almost immediately certain parties thought eight was sufficient. A great many who made a business of selling bees at so much a colony preferred eight, because they are easier to handle. Of late, however, there has been so much said about having a chaff division-board outside for winter, and then a dummy to contract the space when the bees are storing honey in sections in the summer time, that a great many of us have been obliged to ask whether a hive wide enough to hold eight frames is not enough. Of course, there is danger of letting bees starve where we have only eight combs in the brood-chamber or lower story; and a good many will prefer a hive to hold ten frames on this account. An eight-comb hive is easier to handle, because you do not have to reach so far over. There is also quite a saving in expense, because a narrower board will do for covers and bottoms, and they are less trouble to handle. The bees are also more likely to put all their surplus honey in the sections above, for there is but little room to store it below when the combs are well filled with brood.

With an eight-frame hive, however, we must many times begin feeding as soon as the surplus honey is removed from above. This is especially the case with black bees; so you see, friends, it depends much on the kind of man as to the number of combs we should have in the brood-chamber.

QUESTION 116.—*Do you prefer the closed end or hanging frame? Give reasons.*

I have never used any closed-end frames.

O. O. POPPLETON.

Hanging frames, because they are so much easier to work with.

P. L. VIALLOX.

The hanging frame, on account of greater ease of manipulation and less injury to bees.

R. WILKIN.

I use and prefer the L. hanging frame, and prefer it for ease of manipulation.

MRS. L. HARRISON.

Hanging frames. I think they are more easily handled, and more perfect in their adjustment.

H. R. BOARDMAN.

I prefer the hanging frame. There are many reasons, but chief among them is ease of manipulation.

GEO. GRIMM.

Hanging for L. frames—that is, in a common L. hive; the combs can be moved so as to make room to get out the first frame.

E. FRANCE.

Hanging frames. Principally because they are more easily manipulated, and are not so liable to kill bees during manipulation.

G. M. DOOLITTLE.

I prefer a hanging frame, for I work mostly for extracted honey, and I want to remove them readily. In my locality, or perhaps I should say with my bees, every thing gets glued fast that it is possible for them to fasten.

A. B. MASON.

Hanging. I think I should like the warmth of the closed ends, but I think the hanging frames so much easier to handle, and it is possible to move them so as to vary their distances apart. I must confess, however, that I never had much experience with closed ends.

C. C. MILLER.

I prefer the hanging frame. To gain entrance to the other kind is too much like breaking into a burglar-proof safe; and to get out of the scrape and close up, one adds wholesale murder to burglary. Possibly familiarity with some better form of the closed-end frame would mollify me somewhat; but I do not think I shall ever be won over.

E. E. HASTY.

We have tried the closed-end frames, but we killed and enraged bees every time we opened the hives. At one time we crushed a valuable queen, and then resolved never to use these frames again. The theory of manipulating hives instead of frames can not hold with the pure Italian bees, which cling to the combs so much that it is impossible to shake them off.

DADANT & SON.

I want neither closed ends nor closed top-bars to my frames, because a glance will tell me where, in winter or spring, the cluster is, or where I may find the queen. No bees need be killed by taking out or replacing the frames, which can not be avoided if the frames have closed ends or closed top-bars, not to speak of the slower, unhandier process of manipulation with the latter.

CHAS. F. MUTH.

Hanging. Greater ease and convenience of handling. I am still in doubt about the Heddon hive. While it is certainly an admirable hive for the expert, I am not so sure for the beginner. I am not ready to recommend it yet for all.

A. J. COOK.

I prefer the closed-end frame, because it is better to winter and spring bees in, because it can be as easily and rapidly manipulated as any, and it kills as few bees as hanging frames, and because it is the best hive for moving bees in. The new Quinby hive, which we use, can also be contracted to suit the requirements of the smallest colony, or enlarged for the strongest, without any extra division-boards or extra pieces.

P. H. ELWOOD.

I prefer the closed-end frames as used in connection with the new hive; and my reasons in general are, that, with the arrangement, I received the numerous advantages long ago claimed which only closed-end frames can give, and at the same time do away with the past objections to closed-end frames which really overcame their advantages as compared with hanging frames. I deem this department too limited in space to go into an enumeration, or describe all the advantages and disadvantages.

JAMES HEDDON.

I very much prefer the closed-end frame, whether standing or hanging. The first reason is the fact that each space retains its own warmth so much more than when open; and I find, when tested side by side, that, in early spring, I can build up light stocks that would be lost with the open-end frame. Capt. Hetherington once said to me, that he had saved 100 stocks of bees that spring that would have been lost had he used the open-end frame. I believe one of the greatest secrets of success in Julius Hoffman's management is in his use of a frame closed part way down with enameled cloth, pressed down upon the top of the frames.

L. C. ROOT.

I prefer a closed-end frame for my use. Such a frame is, perhaps, not advisable for one who is rearing queens or selling bees by the pound, nor for the learner to gain knowledge and experience most easily. But for the production of honey as a business, in large apiaries, by those who have already served their apprenticeship, I believe closed-end frames have decided advantages. While they are not as movable as metal-cornered hanging frames, they are sufficiently movable for all practical purposes, and they are immovable when you want them so. A hive full of combs may be handled as though it were a single piece instead of a collection of loose pieces, thus saving work, worry, and time. You are not obliged to stop to space the frames every time they are handled. When a swarm is hived in them you know the frames are at the proper distance, and can not slide together, producing crooked combs. If you use foundation in wired frames, your combs will all be built straight, even if the hive should not stand exactly plumb. In carrying, handling, hauling, or shipping, the frames do not need to be fastened, yet can not slide together, killing bees and queens.

JAMES A. GREEN.

Before I read any of the answers to the above question I knew pretty well how it would go. Out of 18 answers, 14 are in favor of hanging frames; but the other 4 are men of such wide experience and reputation

as honey-producers as Elwood, L. C. Root, Heddon, and friend Green. Perhaps friend Green has not produced the crops of honey that the other three have, but he is a bright, progressive young bee-keeper. I am a little astonished at him because I didn't know that he used the closed-end frames at all. Were we in a convention I should be a little fearful that we might have some speeches in regard to this matter that would be a little unkind. Perhaps not, however, for conventions of late years have got into a way of being very courteous and charitable, even though some few should have ways of working, and ideas, that seem to the larger number beyond comprehension. I can readily understand why a bee-keeper should consider the closed-end frames best; and I can readily imagine how Capt. Hetherington saved 100 colonies by having closed-end frames; but I confess I can not understand why our good friend Elwood can say the closed-end frame "can be as easily and as rapidly manipulated as any." Now, I do not mean to dispute this statement at all, mind you; and I can readily believe that, with his long practice with them, he can get along faster himself than with hanging frames; but I very much doubt whether those of us who have always used hanging frames could ever learn to work closed-end frames as rapidly as he does. I have long been thinking of visiting our friends in York State, in the height of the honey-flow; and perhaps I may some time have the pleasure of seeing our good friend Elwood work; not this season, however, for I have promised to visit the basswood fields of Wisconsin.

QUESTION 117.—*If you use all-wood frames, do you prefer to have them hang on metal rabbets or on a plain wood bearing, in the production of honey?*

There is little difference. DADANT & SON.

On metal rabbets every time. O. O. POPPLETON.

I prefer them to hang on a metal bearing.

L. C. ROOT.

I should prefer a metal rabbet, with Hoffman frame, as next best to an all-cased end.

P. H. ELWOOD.

On a plain wood bearing. Then they are always ready to haul, without fastening the frames.

C. C. MILLER.

I use the all-wood frames hanging on tin rabbets—too much propolis to have frames on wood bearings.

P. L. VIALLO.

I would never have metal corners, and on the whole I think I would not have even metal rabbets. I have only wooden rabbets now.

A. J. COOK.

I use all-wood frames hung on wood bearings. Metal rabbets are a source of constant annoyance to me, and the few that I had I have discarded.

GEO. GRIMM.

We use all-wood frames, with wood bearings. I don't see how either way can make any difference in the amount or quality of the honey.

E. FRANCE.

I use the wood-bearing. After years of experience along this line, I think there is little difference in favor of either kind of bearing, when taking all things into consideration.

G. M. DOOLITTLE.

I use metal rabbets, and could not be induced to go back to the wood-bearing.

A. B. MASON.

Metal rabbets, by all means—and I use metal corners too. If we believe in movable frames, let's have movable frames, and no swindle about it.

E. E. HASTY.

With either hanging or fixed frames I always use all wood; but when I use the hanging frames I prefer a plain wood rabbet in the brood-chamber, and a simple metal rest in the extracting supers.

JAMES HEDDON.

I use wood bearing, for the reason that I have the bearings notched for spacing the frames; then my frames are always the proper distance apart. Frames hanging on metal rabbets are easier to manipulate.

MRS. L. HARRISON.

There is not much difference between a rabbet of wood or one of metal; but I prefer my all-wood frame to rest on a metal rabbet, but not on the sharp edge of the tin. I do not want my frames to rest on a plain wood bearing.

CHAS. F. MUTH.

I prefer to have them on metal rabbets, especially in the upper story. I do hate to be prying frames loose every time I have to move them; but in lifting off the upper story I sometimes wish the lower frames were held down by propolis.

R. WILKIN.

I always used metal rabbets with the ordinary hanging frames; but with the closed-end frames I find them unnecessary. The ordinary all-wood frame in a wooden rabbet is not as readily handled as a properly made closed-end frame, yet it is not as secure as the latter.

JAMES A. GREEN.

All the hives that I now have in use have the metal rabbets; but I am almost tempted to say that, if I had it to do over again, I'd have none of them in my hives. It takes a long time to find out, sometimes, the real value of an "improvement."

H. R. BOARDMAN.

This question, too, like the one before it, depends much on what one is going to do with his bees. If he is going to raise queens, I feel quite certain that he will make money by having metal rabbets and metal corners. If he is going to raise comb honey, and have out-apiaries, so that the bees are to be frequently moved several miles, I think quite likely he does not need either metal rabbets or metal corners; and it would not be surprising to me if he ultimately decided on a closed-end frame, especially if he is working for comb honey. I have visited many beekeepers of late years, who say they have hives in their apiaries from which the brood-combs have not been removed in years. If that is the way we are going to manage, we can not only dispense with metal rabbets, but we may have closed-end frames, and a few have been bold enough to say there is no particular need that we should have frames at all—just have a shallow brood-chamber, something like Heddon's, and let the combs be built in solid. So you see that much depends on the habits of the owner, and what he is working for. To tell the truth, I, years ago, planned a box hive. You will find it in the old volumes of GLEANINGS, and I have studied on the matter considerably at different times of late years.

OUR HOMES.

Thy way is in the sea, and thy path in the great waters, and thy footsteps are not known.—Ps. 77:19.

CONTINUED FROM LAST ISSUE.

THE friends will remember that I left off at our last issue where the guide was just ready to take me to the cave. The strong door was unlocked, and the guide handed me a lamp. Just then, however, I remembered that I was thirsty; and as I did not want to travel through the cave in that condition, I asked the guide if we could find any water to drink, in the cavern. He replied there was none. Furthermore, there was none at the office by the entrance. He said the only thing they had was some Manitou spring water, in bottles—15 cents a bottle. Don't be uncharitable, dear friends. That is about the way they do things at all these fashionable resorts. I decided, however, to pay the price, even if the water does run away in a quantity large enough to run a small sawmill, right at the foot of the mountain every day in the year. As it happened the water was bottled from the same spring I tasted the day before, that I thought was not very good. The cork flew out of the bottle with a pop that might have satisfied any schoolboy; and as the guide poured it into the glass, it fairly smoked and sparkled with foam. Good? Why, my friends, it was about the most delicious drink I ever tasted in my life. Don't ever say again that *stolen* waters are sweet. They will not compare with that which has been honestly paid for, and the thirst for it earned by hard work in climbing mountains, and, above all, taken with a clear conscience, and with thanksgiving to God, the great creator of the mountains and springs, and all the wide universe. While I remarked that one glass was plenty for the time being, I noticed he corked the bottle and set it down by the side of the telescope. The water is so pungent you can take only a swallow at a time. He says they have an arrangement for bottling it under pressure before it reaches the surface of the ground.

And now for the Manitou Cavern. It is much like Mammoth Cave, only on a smaller scale. Before we had gone into the mountain many feet I uttered exclamations of surprise at the beautiful white alabaster icicles, for that comes nearest in description of any thing I can think of. Each icicle had a drop of crystal water hanging to its tip, and these drops of water glistened like so many stars. Where the water trickles down them fast enough to fall off, stalagmites are seen right under them. The very old ones have grown brown and gray with age; but the new ones are glossy, and bright with the liquid that encases them and makes them grow. Of course, like every one else I wanted one to take home as a specimen. But the guide told me that, if they had not decided to shut down on every demand of this kind, their cave would have been ruined in no time. I admitted this, and yet it seemed rather hard that I could not have just *one* little one. Well, a good many

times the guide takes a dozen or more people in at once. Some of them, of course, will persist in loitering behind, and these are the chaps who snap off the icicles, and carry them away. In fact, during this past season the matter has become so bad that they have been obliged to cover all the finest ones with a protection of poultry netting. I confess that the sight of the netting around these beautiful products of nature does not seem to be just in harmony; but what are they to do? The guide stuck his cane through one of the openings in the netting, and gave one of those beautiful icicles a rap. I supposed that he would, of course, send it flying. But instead of that it rang out like a bell—the sound echoing and reverberating away through the galleries of the cavern. Again and again he struck others in the same way. They did not break, but every one of them gave forth a musical note. Some of them sounded like a silver bell, and this is the peculiar feature of Manitou Cavern. Further on, the impregnated water had run down the side of the cavern, and coated it with a polished covering.

"This is what we call the 'Wet Blanket,'" said the guide; and he hit it a clip with his cane. It rang out, too, like a great bell. During the wet season of the year this impregnated water sometimes forms pools on the floor; and as it runs over the edges it forms this white alabaster stone. As it rises higher and higher it makes the edge of it a basin, with many islands in the center, all incased in alabaster. As we passed under some vast domes above, that seemed to go away up toward the top of the mountain, a reverberating roar, rising and falling like the tones of an æolian harp, arrested my attention. I stopped and asked for an explanation. He said it was a sort of echo or reverberation of the sounds in the cave. I could not be satisfied, however. I gazed up at the rocky vault above, then up one gallery and down another, and finally I began to consider a sort of quizzical look on the face of my guide.

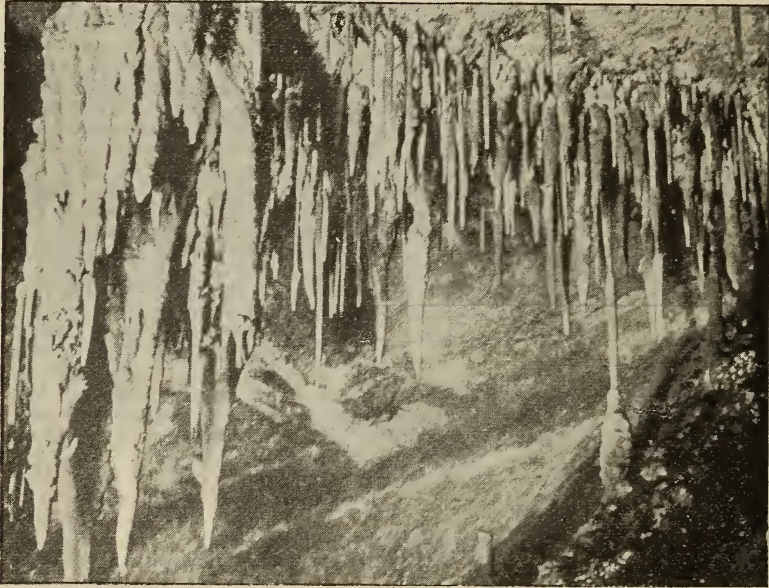
"Look here, old chap, you are humbugging me a little. Aren't you making that sound with your mouth?"

He laughed, and admitted that he was. But I forgave him, especially as it was so wonderful to think that a feeble human voice could awaken such a frightful roar as that. The guide is something of a musician, as I will tell you presently, and he had discovered that, by striking the keynote of that dome, he could almost make the whole mountain vibrate, as it were. As it is a difficult matter to keep his voice in perfect unison with the vibrations of the dome, he would occasionally waver to a little lower note and then higher, and thus caused the roar to rise and fall, in a way that seems almost startling. We now came to some wooden seats, and the guide asked me to sit down while he gave us some music. As I composed the whole audience, I spread myself, as it were, to do justice to the occasion. He climbed some stairs to a grotto above and some distance away from me. Then he remarked, by way of apology,

that dame Nature had not builded their organ exactly as he would like to have it, therefore he was obliged to do the best he could under the circumstances. I was fully agape, not only with eyes, but mouth wide open. Said organ was only a collection of stalactites, but, to tell the truth, it did look somewhat like a great pipe-organ. Some of the bass pipes were perhaps a foot through, old and gray with age, while the highest notes were made by striking with his cane some of the smaller delicate white icicles, such as I have described, and I tell you the music was not only funny but good. The heavy bass was not quite in tune, but it rather added to the performance to hear some of those great fellows "grunt," as it were, their part of the melody. I believe he played five different pieces in all—Green-ville, Yankee Doodle, and a simple melody for which I know no name except that we used to call it "My Father and Mother were Irish."

saw the Cauliflower Garden, where dame Nature is growing cauliflowers of alabaster. They just grew up, and were all formed from a damp rock. Alabaster stars were growing on the walls of the cavern in many places where it is damp, and I am told that a damp fog that is seen in some places deposits this white carbonate of lime on the walls and ceilings of the cavern. Many other things not mentioned here were not particularly different from Mammoth Cave, in Kentucky. This cavern, however, is so high up in the mountain that there are no rivers or lakes such as Mammoth Cave furnishes. Its special attraction is the beauty of the stalactitic formations. Many of them are so translucent, that, when your lamp is held on the opposite side, they look very much like a coal of fire, and every one of them, big and little, gives forth these musical notes.

When I got out of the cave I was ready for the rest of that spring water, corked up



THE PIPE-ORGAN OF MANITOU GRAND CAVERN.

The concluding piece on the organ was an imitation of the Swiss bell-ringers, and some parts of it were almost complete. If you shut your eyes you would imagine you saw the performers as they threw their bells on the table and picked up others during a rapid performance; and yet he does it all with simply a couple of sticks, selecting the proper stalactite from among the confused group, just as nature has placed them. I clapped my hands and stamped my feet, but I felt that I was not able to do justice to the occasion.

On our way out we passed the North Star, which shone from the depths of a cavern to which we could not well gain access. The guide explained it as simply a drop of water on the bottom of a stalactite. Then I

in the bottle. I also had another good look through the telescope. Although the building is very securely made, right on the rock, every footstep on the floor shook the instrument so that Pike's Peak seemed toppling as if they had an earthquake. When I spoke about going to the top of it, the guide said no one could get up there at that season of the year. The rocks and every thing else were covered with ice, and it was intensely cold. When I reminded him of the smoke coming from the chimney, he said the U. S. Signal Service requires a man to stay there for the purpose of scientific observation. Down the mountain I started again, and ere long I was at the foot of Rainbow Falls. Now, although the sun shone forth brightly, and the water poured

over the fall to my full satisfaction, not a speck of a rainbow could I see. Perhaps it was not the right time of day.

Before ten o'clock I was down in the town again. As I passed a livery stable I asked them how low they could give me a horse and buggy to drive over to the Garden of the Gods. Their very best figures were \$3.00. When I expostulated a little in regard to \$3.00 for *two* hours' time, they kindly consented to let me stay till half-past twelve. That was the greatest concession I could get. I remembered the time when I saved a dollar an hour in walking home, when the train left me; and just now it occurred to me that I could make more than a dollar an hour, and I did not feel tired one bit. I started off on foot, and alone—no, not *alone*, for with every step I took in that strange weird place, I felt *God's presence, his peace, and his love* in my heart, and I was *exceedingly* happy.

SPECIAL DEPARTMENT FOR A. I. ROOT, AND HIS FRIENDS WHO LOVE TO RAISE CROPS.

ALL ABOUT RAISING SWEET-POTATO PLANTS; ALSO VERY COMPLETE DIRECTIONS FOR MAKING HOT-BEDS FOR STARTING VEGETABLE-PLANTS OF ANY KIND.

IN answer to my inquiry, a short time ago, for a paper on raising sweet-potato plants, 32 very good papers were sent in. These were carefully read over, and portions of a good many were used, besides using some of the communications entire, as you will observe. I aimed to give all the valuable points communicated, and at the same time avoid as much as possible all repetition. As these papers come all the way from as far south as Mississippi, and clear up to Michigan in the North, it is quite interesting to notice the varied methods adopted in consequence of the difference in climate. We start out with a paper from a friend in Michigan.

HOW TO GROW SWEET-POTATO PLANTS IN MICHIGAN.

Friend Root:—I have been growing sweet-potato plants more or less all my life, and here, for 24 years past, frequently 100,000 plants in a year. I used to live in Southern Illinois, where we grew plants readily without glass, using boards or any kind of covering at night and in stormy days, and leaving the beds open in day time when the weather was fair. Of course, the time for bedding the potatoes will need to be varied so as to suit each man's locality.

Good seed potatoes are of the first importance; and if not already on hand they should be ordered of a reliable party, as near by as possible, so that they need not be long in transit. Most reliable seedsmen will furnish such potatoes as are best suited for bedding-out purposes; but on no condition buy potatoes that have been exposed for sale in the city markets, as they are liable to have been so chilled as to cause them to rot, as they will not safely bear a lower temperature than 38°.

I usually bed sweet potatoes about April 15th to 20th, and order potatoes shipped a few days earlier, so as to have them ready at the desired time. If the weather is not favorable delay it a few days, as

exposure to cold in shipping is risky. Use fresh horse manure for making the bed; that is, such as has not already been heated and the heat expended. It should be prepared a week or ten days before the bed is wanted, by piling it up and moistening it, if not already moist, so that the heat will become thorough and uniform throughout the pile by the desired time.

If the ground is porous, so that it will not hold water, a pit may be dug, 18 in. or 2 ft. deep, into which the manure should be evenly spread and carefully packed down, so that it will not settle out of shape, and so that the heat will be uniform as possible. A frame of the desired size made of any cheap lumber that will not warp badly, should be set over the pit or bed of manure. This frame should be about 9 inches deep in front, and 15 on the back (the end pieces being sloped to match), so that the sash will have pitch enough to shed water. In this frame fill three or four inches of good fine soil, evenly spread directly on the manure; then place the sash on the frame, and, after the heat has become uniform, and is found to be all right—usually in two or three days—the potatoes should be placed evenly over the surface of the bed—not quite touching each other, and covered with two or three inches more of good fine soil that will not bake—a sandy soil is preferred; then replace the sash and keep a close watch that it does not become hot enough to burn the potatoes. I have never used a thermometer, but I judge of the temperature by thrusting my fingers down through the soil in various places. Sweet potatoes require a strong bottom heat at the start as they are liable to rot. Just so it is safely below the burning-point is all right.

I use sash 3x6 ft., and four of these sash will cover a bed 6x12 ft., which will usually afford accommodation for one barrel of potatoes, if they are of about an average size. If small, more room will be required. I seldom split potatoes, as they are more liable to rot; but if large, so as to require splitting, the round side should be placed down. One bushel of good seed sweet potatoes should give 5000 good plants, if every thing goes well, and the plants are removed as fast as ready; sometimes more than that number, but oftener less.

After the potatoes are placed in the bed, and the sash are on, constant care must be exercised to see that every thing goes right. The bed will require airing more or less every day from 8 or 9 A. M., to 4 or 5 P. M., especially if the sun shines; but they should be closed during the night; and if it is cold enough to freeze, the sash should be covered with mats, old carpet, or any thing that will protect from the cold during cold nights or stormy days. As the season advances, and the weather becomes warmer, the sash should be removed entirely during the warm part of the day. If this is neglected, the plants will become "drawn"—that is, tender and worthless for planting. About a week after the potatoes have been planted they will begin to throw out roots and show signs of growth, at which time the bed should be well sprinkled with water, and this repeated as often as necessary to keep the ground in good moist condition. As the bed fills up with plants, a large amount of water will be required, usually a painful under each sash every evening, if the weather is sunny and warm. Good plants will usually be ready in three or four weeks from the time of bedding the potatoes.

If the ground is such that a pit would hold water better, make the bed entirely above ground, simply banking up to prevent the escape of heat from the sides of the bed, or a frame may be made deep enough to contain both the manure and the soil under and over the potatoes. D. C. EDMISTON.

Adrian, Mich., Feb. 25, 1889.

KEEPING SWEET POTATOES FOR SEED AND FOR PLANTS.

First, dig sweet potatoes, intended for seed or for keeping, before any frost kills the vines. Dig on a clear day, if possible, so the tubers may dry well; after lying in the sunshine, remove to an out-room and spread out to cure and evaporate superabundant moisture. Should quite cool weather come on, cover with old blankets or carpet. On no account must the temperature of the tubers get down to 32°, or you will not need a hot-bed for that lot of tubers. On approach of freezing weather we pack in barrels and remove to a room that is warmed so as to not fall below about 40°, keeping the barrels open to air. They are packed in the barrels as apples are, with no packing between them. They should be handled so as to bruise as little as possible. We remove our seed tubers to the sitting-room which is warmed pretty regularly all winter, on the approach of severe weather. We generally keep about two barrels of tubers over for seed, and seldom lose more than ¼ bushel out of the lot. I have repeatedly tried keeping tubers in my cellar, a very nice dry warm one, but they invariably rotted before spring.

About the last week in March we get our hot-beds ready, using forest-leaves and strawy manure, principally leaves, as we have them in abundance close at hand, and the process of fermentation and heating goes on much slower, and lasts much longer, than with all straw manure. We tramp this heating material down a foot deep at least, and cover with about 5 inches of soil, composed of pure sand, woods-earth, and coal-braes from old charcoal-pits. I presume any good rich loam will answer, the blacker the better, as it will absorb the sun heat better. Put on sash and heat up; and as soon as the ground is warm through, which can be found out by running the hand down in the soil, put in the tubers, sinking them at least 1½ inches below the surface. Give the beds all the sun heat they can get, even until they fairly steam. Sweet potatoes will not germinate well unless kept very warm and moist. If plants come on too soon for your market, pull off as soon as 5 or 6 inches long, and "heel in" in nice fine earth, keeping shaded and wetted for a few days until they strike root, after which they are the best for transplanting. Should they be kept too long in this condition they will commence forming little tubers, after which they are useless for planting, as they will not throw out a second set of tubers. I would especially caution against using such plants. The large tubers we place in the hot-beds by themselves to sprout; and, as soon as started, we split them in two, plant the cut side downward, so as not to have long dangling plants. If large tubers are cut in halves before they begin to sprout they are liable to rot. I would on no account cut them before. Tubers should be 4 or 5 inches apart, so as not to crowd the plants. Plants should all be pulled as soon as 5 or 6 inches high, as long plants are not desirable; and to allow a new set to grow. We sometimes have

4000 to 6000 plants heeled in before a single plant is sold, and grow from 20,000 to 40,000 per season.

The sweet potato is a lover of heat; and if you want a nice lot of plants, their bed must be kept quite warm. Cloth shades are of no use; use only sash with glass, and cover the sash at night with old carpets, rugs, or matting, or even plank, to retain the heat, much of which would be lost through the glass.

To recapitulate: Tubers must be kept warm and dry, and not fall below 40° in temperature. Hot-beds must be made quite warm, and *kept so*, and beds kept stripped of plants over 4 or 5 inches above ground. Last season was very unfavorable for hot-beds, as the weather was cloudy most of the time, and surface heating was of little avail. We could have sold 100,000 plants had we had them, as many beds failed to germinate, on account of a lack of heat. We have been growing plants for market for ten years. E. G. KINSELL.

Green Spring Furnace, Md.

USING CLOTH TO COVER THE BEDS, ETC.

Friend Root:—I have been engaged in the business to some extent for the past 20 years. The manure of which the bed is composed should be forked over a time or two besides the handling it gets in hauling from the stable and unloading where the bed is to be constructed. About the first of April (I write for my latitude) I find early enough to build the bed. I use a pit about 12 inches deep, in which I place about 15 inches of manure from the horse-stable. Here I would say, that, should it contain a great deal of straw, it will need more forking. The object of the extra forking is to get it thoroughly mixed. I scatter over the bed, treading down evenly and firmly. My beds are designed to take a frame made of three 16-foot boards for the sides, 12 inches wide, one board in front, two at the back, with sloping end-pieces 5½ or 6 feet long. The bed, or pit, should be one foot larger every way than the frame. The above size will hold about one barrel or 2½ bushels of potatoes as they should be bedded. I place ribs, or cross-supports, about 2½ or 3 feet apart, to support the canvas, which I make of heavy unbleached sheeting, a yard wide, two widths stitched together about 5 yards long, requiring 10 or 11 yards for one frame cover, costing 8 or 9 cents per yard. Now, to avoid the trouble you speak of I tack one of the long sides to a light straight piece of board, usually 3 or 4 inches wide, one thick, the other side and two ends being supplied with light rings about ½ inch in diameter, sewed in loops on the cover about 2 feet apart, which are to be hooked over nails tacked in the frame to hold the cover on the side on which the roller is attached (for such it is) is also secured in a similar manner. Whenever it is desired to give the bed an airing, unhook and roll back as far as desired, not unhooking any further back on the canvas than you wish to roll. Of course, if the day is warm enough the end rings can all be unhooked, and the cover quickly and neatly rolled to one side, secure from any ordinary wind. I next place from 4 to 5 inches of soil on it. From the 10th to the 20th of April is soon enough to bed the potatoes. My experience leads me to say more potatoes are ruined by being placed in a bed *too hot* than one *too cold*. It is best, of course, to avoid either extreme. It is to be understood, that good sound seed is advised. Level the soil nicely, free from lumps or clods; place the potatoes from

$\frac{3}{4}$ to 1 inch apart, parallel over the bed, not letting them touch anywhere, splitting those that are $1\frac{1}{2}$ inches or more in diameter, placing the split side down. Cover about three inches deep, with good mellow soil. After the plants appear, which will be in 12 or 14 days, give water as needed. If placed closer than above, it is a hard matter to remove the plants without destroying too many young ones. About 4 or 5 weeks from the time of bedding, the plants will be ready to draw. As to varieties, Yellow Jersey and Yellow Nansemond seem to give the best satisfaction here. I usually get from 6000 to 8000 plants from a bushel of seed from the above varieties. I formerly tried saturating my canvas with linseed oil, for the purpose of making it waterproof, more transparent, and durable. I soon discarded the practice, as I found it utterly useless, as, after that time in the spring, we are not apt to have very long-continued cold weather, and the bed should be protected by shutters or plank to keep out cold and heavy rains. In no case should it receive a heavy cold rain early in the season. The oil has a tendency to rot and cause the canvas to break, thus proving an injury instead of a benefit.

Any one who has had experience in making hot-beds will soon learn that, the fresher the litter the more violent the heat, and sooner it will need forking over to prevent fire fang, which will be in from two to three days, four at most, from the time of first hauling.

W. H. GRAVES.

Duncan, Ill., Feb. 18, 1889.

RAISING SWEET-POTATO PLANTS, ETC.

About twenty years ago I was a grower of the plants quite largely, sending plants one season into 23 different States. Greenhouses are too damp; as a general thing fire heat otherwise. At least I did not make a success of it, though I believe it has been done on quite a large scale. The simple hot-bed, that there has been so much written about, yet no one ever made two that were just exactly alike in all their workings—too hot or too cold, too wet or too dry, weather not just to our liking, something the matter, that nothing but the best judgment could get along with and bring out the best results—as I was going to say, the simple hot-bed is the best, just as you would make it for any purpose, with three or four inches of good compost on top; then take the potatoes, if not over one inch in diameter, without cutting; spread them over the bed about as far apart as the size of the potatoes, keeping away from the edges of the bed four to six inches; then cover one to two inches with the same rich compost, screened so as to be uniform in consistency, and of a material that will not pack. Now cover the bed with boards (I have seldom used either glass or cloth for sweet potatoes); watch close; the temperature wants to be just about the same as for tomatoes, cucumbers, etc. As soon as the plants appear, which should be in about ten or twelve days, add one to two inches more of compost, so that the entire depth will be three to four inches. Now you can commence to give a little water—very seldom any is needed on the bed until the plants appear. They must now have plenty of air; and as the time is supposed to be some time in May, they will need but little covering except nights.

The usual time for putting the potatoes in the beds is from the 10th of April to the 1st of May; and for setting the plants, from the 20th of May to

the 10th of June, in this climate. I have raised excellent plants in a very mild hot-bed on a sheltered hillside sloping south, putting in the potatoes the last days of April, without using any covering whatever over the bed, and had the plants ready for setting the first days of June.

Potatoes larger than an inch in diameter I cut lengthwise through the middle. They will bring more plants, and quicker, than whole potatoes; but there is more danger of their rotting in the bed than whole potatoes. The rotting of the potatoes is caused by cold-dampness, and lack of air when the bed is too warm.

To keep the potatoes over winter, harvest carefully before frost kills the vines; spread in some dry place a week or so, then pack quite tightly together in dry barrels—old flour or cracker barrels—up to two inches of the top, then put on clean dry sand that will shake in and cover the two inches left; store in a dry place, and keep the temperature at 60 to 65 all the time.

You know enough about the management of hot-beds and every thing else, for that matter, to know that no amount of instruction either written or verbal will bring success. Nothing but experience will bring the needed knowledge, and that to a few only.

D. CUMMINS.

Conneaut, O., Feb. 18, 1889.

Friend Cummins also incloses a copy of one of his old circulars. As it contains much additional information, we give it below:

CULTIVATION OF THE SWEET POTATO.

Light sandy or loamy soil is best, but heavy soil well drained, with plenty of coarse manure well worked in, will do very well. Plow and harrow well; and if your land is poor, plow light furrows about three and a half or four feet apart; scatter in them a quantity of partly rotted manure, throw two furrows together over the manure so as to have the ridge quite high, and not very broad on top. Unless rain has fallen within twenty-four hours, or the soil is quite wet, it will pay to water when setting out, which may be done as follows: Thrust the right hand into the ridge (a mason's or garden trowel would be better), draw it toward you, and with the left drop the roots at the back of the hand or trowel; draw the soil around the roots; pour in about half a pint of water, then fill up with soil so the plant will be an inch or so deeper than it stood in the bed, so the stems of the lower leaves will be covered, as then it will sprout again if cut by frost or worms. Set the plants from fourteen to sixteen inches apart; keep clean from weeds, and the soil mellow with cultivator and hoe. Raise the vines with rake or fork to prevent rooting at the joints; the more moist the weather, the more frequently it will need be done. Dig if possible before severe frosts; store in a warm dry place—a damp cellar will not answer. With good cultivation the crop will average three hundred bushels per acre. Plants will be ready by the 15th of May, and can be set from that time until the 1st of July. One year I set a small patch the 25th day of June, in very rich soil, the yield of which was at the rate of over six hundred bushels per acre. My plants are grown entirely without glass, and are very hardy; they will be carefully packed so as to go hundreds of miles in good condition.

THE FOLLOWING IS FROM THE FRIEND WHO TOLD US HOW TO RAISE \$10.80 WORTH OF GRAND RAPIDS LETTUCE ON 12 FEET SQUARE OF GROUND.

Raising sweet-potato plants for sale has been right in my line of business for the past 14 years. I have always raised them in hot-beds. My frames are 6 feet wide by 12 long; front of frame, 8 inches high; and back, 12 inches high, covered with four 3 x 6 sash. For heating material I use fresh horse

manure, with considerable straw and forest-leaves thoroughly mixed and thrown into a large heap to heat. When it gets steaming hot I fork it over into another heap to heat up again, by which time it is ready for the bed or pit, for I dig a pit 2½ feet deep and 6 inches larger every way than the frame. Into this pit I shake the material, being careful to get it in as evenly as possible, at the same time treading it down solid and building it up 6 inches above the level of the ground, banking up the outside with dirt to keep the heat from escaping sideways. I now set the frame on and put on the sash. Now the bed will heat up the third time, and we must wait a few days until it cools down; for if we put the potatoes on while it is too hot they will surely decay, and the whole thing will be a failure. I watch it very closely with a thermometer, by plunging it down deep into the bed; and when the heat recedes to 90° or a little below, the bed is ready. I now put on four inches of good rich garden soil, and firm it down with a board, and put the potatoes on as thick as they will conveniently lie and not touch; then if one rots it will not affect the rest. I cover with 2½ inches of the same soil that is under them, being careful to have it moist and in good condition. Bank up the outside of the frame a little higher than the dirt on the inside, and raise the frame up so as to give the required depth under the sash. Now on goes the sash, and nothing remains to be done but to give it air on sunny days. I never water until the plants come through the ground. The above plan is for high ground. If the ground is low and wet, the pit must either be drained or the bed must be built on top of the ground.

ORSON TERRELL.

North Ridgeville, O., Feb. 23, 1889.

RAISING SWEET POTATOES AND SWEET-POTATO PLANTS IN RUTHERFORD CO., TENN.

Editor Gleanings:—Thousand of bushels of sweet potatoes are annually raised in this, Rutherford County, and many persons make the production a specialty, and several farmers raise nothing else to sell, and depend solely on the potato as a money crop. In our latitude, Middle Tennessee, about the last of March or first of April they are bedded for "slips." A variety known as the Southern Queen, a white or rather light-pale yellow, is almost universally planted. A raised bed is to be preferred to one even with or below the surface of the ground; and if protected on the north by a plank or close stake fence, the better. In bedding 40 or 50 bushels, a rich loose alluvial soil is selected, and plowed or forked up to the depth of 10 inches; if deeper, the better, and beds 4 feet wide are formed with ditches or walks 12 or 14 inches wide between, made by spading or shoveling the earth upon the beds. These walks give room for stepping around in drawing the slips, without tramping the beds, and also keep the beds well drained and free from too much moisture and subsequent baking. This plan is practiced by large producers for field cultivation, and the potato is not bedded until all danger from frost has passed—or the beds protected—and enough is bedded to set the whole plantation at the first drawing, which is generally about the first of May.

If a great number of slips are desired from one or a few bushels, make a raised hot-bed. In the absence of cottonseed, which we have and use here, fresh stable (horse) manure, well tramped to the

depth of 4 to 6 inches, is as good, and upon which pour as much water as the manure will absorb; then cover the manure with rich, well-pulverized mold, to the depth of 2 inches, upon which place the tubers as close together as you wish, then cover with two or three inches of like rich mold, and let the bed have all the sunshine it can get, but let no water, and especially no cold rain, fall upon it; it must be protected with boards, plank, canvas, or glass, when first made, which can be removed on warm sunny days. When the sprouts begin to crack the ground, add 2 inches more of earth. This will give the sprouts a long shank, and upon which numerous lateral or fibrous roots appear, and which assist the plant in keeping alive when detached from the potato. When the plant begins to come through this second layer of earth, give the bed a good watering; if the weather is warm, use pond water or well water that has stood several hours in the sun, or, what is still better, the suds from the wash-tub. Sometimes weeds and grass start before the plants, which may be removed with a sharp weeding-hoe.

When the plants are from 4 to 6 inches high they can be removed from the bed, and set out; or, if too cold, "heel" out, as nurserymen term it, in large bunches, for a week or two, as they keep better and produce more roots than if set out singly in the garden or field. Before drawing the slips the bed should be watered, which makes the drawing easier, but do not use too much water, or enough to make it muddy. The slips are drawn with the right hand, and not too many at one pull, the left hand pressing the potato, keeping it in place. When but few are drawn at a time they break off easily near the potato. If many are pulled at once, the skin is broken and frequently a plug of the potato comes with the slip, which materially diminishes the next supply. I have raised very nice potatoes from slips set out as late as the 1st of July. The months of July, August, and September being seasonable, potatoes may be harvested about the 1st of October.

If your potatoes are sound, and the weather favorable, in 8 days after removing the slips the bed will again be full and ready for the second drawing. The bed will allow several drawings before the potato becomes exhausted and refuses to send out more sprouts or slips, if kept well watered in dry hot weather. The plants should not be set in the field until the cold rains are over. They become chilled, and are never afterward vigorous, and will not produce good-sized tubers. The preparation of the soil, planting out, cultivation, and subsequent digging and housing of the crop, is reserved for a future paper if desired.

W. P. HENDERSON.

Murfreesboro, Tenn., Feb. 19, 1889.

THE KIND OF SOIL TO PUT OVER THE MANURE IN THE HOT-BED.

On the hot-bed you use *very sandy* soil. I have been in the habit of going down to the river (our place has a long river-front of half a mile); along this, sand is constantly deposited in time of freshets; the whole bank is made up of it. I take this and put it on 4 to 6 inches deep, and lay the potatoes on the bed, almost touching each other, covering them over 2 or 3 inches. You are raising cuttings really—you don't want food for plants. What they want they can find in the sand, as there is enough soil to furnish all they need. In break,

ing off the plants, be careful to put one hand on the potato to keep it in place, and break off with the other, so as to allow the younger ones to grow.

JOHN L. JANENBY.

105 West Walnut Lane, Philadelphia, Feb. 2, 1889.

HOW TO RAISE SWEET-POTATO PLANTS IN MISSOURI.

I have been in the business for several years, and I bed as many as 100 bushels. I dig my pits about 14 inches deep, $7\frac{1}{2}$ feet wide, and about 40 feet long, as that makes as much sheeting as I can handle easily. I board up the north side 3 feet high, and slope my canvas to the south; pack in the manure about 12 inches deep; when packed solid, use plenty of straw, if you want it to heat well.

Skidmore, Mo., Feb. 23, 1889. JAMES PARSHALL.

USING CLOTH FOR A COVERING, AND HAVING IT SLOPE BOTH WAYS.

If a large bed is wanted we sometimes make the frame level six inches above ground; put a light ridge-pole through the center, then draw the muslin over like a house-roof, tucking the ends down at the gables. In this way the length of the bed should be north and south, giving the sun an equal chance on both sides of the roof. Here in Central Illinois we make our beds about April 15th.

Philo, Ill., Feb. 21, 1889.

M. L. BREMEN.

USING WHEAT OR OAT STRAW TO CONFINE THE HEAT OF THE MANURE.

On the manure place not less than 3 inches of light soil, on which put your potatoes, and cover about one inch deep; then over the whole bed place wheat or oat straw about 6 or 8 inches deep, and cover with boards to keep out rain. Be sure to feel under the straw every morning early; and as soon as the heat gets to the top, open the bed every day and cover only with straw at night, and in about two weeks the sprouts will be seen coming through the ground, when two inches more dirt should be put on the bed, and the straw removed entirely. This plan gives me first-class plants in 5 weeks from the time of planting, and they can then be drawn every 8 or 9 days until July.

E. F. BUSICK.

Church Creek, Md., Feb. 19, 1889.

USING STRAW OR LEAVES WITH MANURE IN ORDER THAT THE HEAT MAY BE LASTING.

I put in the trench about two feet of fresh stable manure, and it should be about half straw or leaves, otherwise it may get too hot and burn the potatoes.

If you use glass you want to be careful when the sun shines very hot, or you will cook the whole batch. The glass should be taken off when it is very warm, and put on again at night.

I built a house 14x16, double walls, and filled in with sawdust. I have kept my sweet potatoes and honey in the same house, keeping the temperature at 60° above; and if I haven't had well-ripened honey, no one ever did.

JASPER SMOCK.

Terre Haute, Ind., Feb. 25, 1889.

USING HAY AND BOARDS AS SUBSTITUTES FOR GLASS.

Care should be taken that the manure be all heated alike throughout the whole bed when first put in. Just as good plants can be grown without using sash, by covering the bed to the depth of 12 or 15 inches with marsh hay, and using covers over this made of $\frac{1}{2}$ -inch boards. The bed must be watched

closely; and when the heat is likely to get too high, air must be given by taking off the board covers, and a part or all of the hay if need be. If the plants are likely to get too large at top before you wish to set them in the field, mow the tops off.

Exeter, Pa., Feb. 26, 1889.

P. SUTTON.

The following is from a friend who gave substantially the directions given by the rest. He adds in conclusion:

I have tried this plan for several years, and it has never failed. I sold nearly 30,000 plants last year, and then did not have enough. I also make my beds for sprouting early cabbage, celery, pepper, and tomatoes after the above plan, only I bank up on the outside and cover with glass.

Darlington, Ind.

THOS. N. STOKES.

FORCING SWEET-POTATO PLANTS BY MEANS OF HOT SOAPSUDS.

We force potato-plants sometimes as follows: On washdays, after the washwoman is done with the warm suds we give our potato-beds a good bath, and it makes the plants come right up.

Water Valley, Miss., Feb. 20, 1889. W. H. EMBRY.

A VISIT TO BEE-CELLARS IN NORTHERN OHIO.

ERNEST OFF ON A RAMBLE.

FOR a long time I have contemplated visiting H. R. Boardman and other bee-keepers in the vicinity of Norwalk, O. This opportunity did not come until the last week in February. The principal object I had in making this visit was to study the comparative merits of outdoor and indoor wintering. As you are aware, for the past two years we have had uniform success in wintering in chaff, and as a matter of course incline toward the outdoor method. H. R. Boardman has been equally successful—perhaps more so than we—in his winter repositories.

On the morning of the 26th of February, I found myself in Norwalk. It is with this place that many of our old readers will associate the name of our old friend S. F. Newman, who for a good many years back has been quite an extensive bee-keeper. At one of the leading groceries I saw some very nice honey, stamped with the name of the man whom I wanted to see. The grocer-man informed me that Newman's honey *always* sells, and that he would buy no other. It was not long before I was introduced to the gentleman himself, whereupon I was invited into his office above the store. He is an insurance agent, and, like a good many other bee-keepers, has other business in connection with bees. He employs a clerk to do copying and general writing in the office, and a competent man to take care of his bees while he himself gives his personal supervision to both departments of the business. He has some three out-apiaries. After talking awhile, Mr. Newman kindly invited me to visit his bee-cellar, and, of course, I accepted. On our way thither Mr. Newman said:

"I believe that Boardman has got the way of wintering bees. Although I have

had excellent results in wintering in chaff hives, I believe I shall in time winter all my colonies on his plan."

We arrived at Mr. Newman's house; and after a welcome by the family I was conducted to his bee-cellar—a back room partitioned off from the main cellar. In it he has 127 colonies, all of which seemed to be wintering nicely, with one or two exceptions.

"You see," said Mr. Newman, "I have got tight bottom-boards; but if I were to get another lot of hives I would have the bottoms loose; and I would pile the hives up in a repository just as Mr. Boardman does, without bottom-boards, leaving the latter on permanent stands."

Of course, there was the strong odor of ordinary wintering repositories.

"From what source do you get your ventilation?" said I.

"From no source at all."

"Don't you have an underground sub-earth ventilator?"

"No sub-earth ventilator. There is an opening," said he, pointing to a small window in one corner, "that I used to use; but you see it is now plugged up tight."

"And your cellar-door is tight, is it?"

In response he closed the door and left us in absolute darkness, showing just the way he left the bees. As we left the repository, Mr. Newman said:

"It is a mystery to me how that man Boardman carries his hives into the cellar without the bottom-boards. It seems to me the bees would be dropping and flying out, to the discomfort of the carrier."

"Yes, I should think so too; but I am going down to East Townsend to-morrow, and I am going to find out just how he does it."

Mr. Newman is quite enthusiastic on the matter of out-apiaries.

"Why," said he, "last summer my bees in the home yard had done little if any thing. Things went on thus, even through the summer. At my Bronson out-apiary I discovered that the bees were filling up on something. This proved to be nectar from the peavine clover, of which there were large quantities in fields near by. They not only filled up, but were actually storing surplus. During this time my bees at home were doing little if any thing."

"How much of this peavine-clover honey did you secure from this apiary?" I asked.

"Three thousand five hundred pounds, nearly all of which was gathered after the basswood season closed; and it is the same honey which you admired in the store when we first met. I have noticed before," he continued, "that a difference of only a few miles makes a considerable difference in the secretion of nectar at times."

The swarms in the Bronson apiary were hived upon empty frames, and so far Mr. Newman is pleased with the plan.

After a pleasant chat with the family, I left. The following morning found me *en route* for East Townsend, or, rather, Collins, as the Railroad Guide has it. It seems to me unfortunate that there should be one name for the postoffice and another for the

railroad, both designating the same place. As Collins is only a short distance east, I am soon at the station. Upon inquiry I find that I must go directly south—following that long walk southward I saw yonder. After going but a short distance I inquired of a bright-looking school-boy, with books under his arm, where I might find the residence of H. R. Boardman.

"Well, sir," said he, "you go straight ahead until you come to the postoffice. Then you turn to the right, and go down that street until you find a whole lot of bee-hives, and then you turn in."

"Thank you," said I, with assurance. "It is the man with a 'whole lot of hives' whom I wish to see;" and with such directions I should certainly have no difficulty in finding the place. A short walk brought me to the postoffice; and upon turning to the right I saw a man who looked very much like a bee-man I had seen a few times at conventions. He was "the man who never loses any bees." Although I had not given my friend any warning of my expected visit, I could hardly have called upon him at a more opportune time. He was on his way to the postoffice, and, being a little "under the weather," as he said, he was rather yearning to see somebody to talk with. On approaching his residence I found no bee-hives, but a "whole lot of hive bottoms."

"Then you do leave those out the year round?" said I, as we were entering the house. The morning was a little chilly, and the warm base-burner fire, which greeted me as I sat down in an easy-chair, was cheerful indeed.

Glancing about me while my host was disposing of my coat and hat, I discovered some beautiful specimens in taxidermy—some 200 specimens I should guess. There were stuffed birds and quadrupeds, as natural as life could be, from this and adjoining States. Among the number were some quite rare specimens, all of which was the work of friend Boardman during his spare hours in winter or other times when his bees did not demand his attention. He enjoys it as a hobby, and well he may. He is, without doubt, a close student of nature—not only with the little busy bee, as I shall presently try to show, but with all animate creation.

While we were talking I could not help noticing the affiliation between a cat and a dog, lying at our feet, the former sleeping quietly across the dog's paws, as affectionately as a couple of lovers, although the dog, when he observed that our attention was directed toward them, did not seem to regard the intrusion of his feline friend with favor. A low growl announced that he was seemingly ashamed to be seen in such company. The cat gave no particular heed, but, on the contrary, rubbed against her companion as though she understood him. I did not fail to notice the intelligence of all the dumb animals around friend Boardman. Even the horses were bright, and seemed to know their master.

Continued April 15th.

GLEANINGS IN BEE CULTURE.

Published Semi-Monthly.

A. I. ROOT,
EDITOR AND PUBLISHER,
MEDINA, OHIO.

TERMS: \$1.00 PER YEAR, POSTPAID.

For Clubbing Rates, See First Page of Reading Matter.

MEDINA, APR. 1, 1889.

And I will give them a heart to know me, that I am the Lord; and they shall love my people, and I will be their God, for they shall return unto me with their whole heart.—*Jer. 24: 7.*

THE DOVETAILED HIVE.

THE new dovetailed hive seems to be taking well, for orders are beginning to pour in for it at a good rate. At the solicitation of some practical beekeepers we have made the Dovetailed T super with thick ends, thus throwing out the objectionable loose boards to take up the waste space in the end. The section-holder super is also made deep enough to leave a full bee-space above the sections. W. Z. Hutchinson, whose advice we have sought, says, in a private note, "With the changes you have made the hive is well nigh faultless." He prefers the new Heddon hive, but next to it he says stands the Dovetailed hive as we now make it. We are now making some new engravings to illustrate it as modified, and will give illustrations and further particulars in our next.

Many questions come in to this effect: "Will the Dovetailed hive take the Simplicity frame, and will it take the $\frac{1}{2}$ -depth wide frame?" It will take the Simplicity or Langstroth, to be sure; but the supers will not take the half-depth wide frames. We can make them deeper to take the half-depth wide frames if desired, but we shall have to charge some more.

MORE ABOUT SWEET-POTATO-PLANTS.

I HOPE the friends will not complain because we have made this so much a sweet-potato number. The principles that are taught by the many letters apply not only to raising and starting plants of any description, but they are valuable to anybody who is interested in or who has any thing to do with the garden or with agriculture; and I want to give you two more letters that are furnished by R. M. Reynolds, of East Springfield, O. The following was from Waldo F. Brown, in the *Ohio Farmer*, some years ago:

The great danger in sprouting is, that you get them too hot and scald the potatoes. I lost a large part of my potatoes for several years from this cause. . . . I found, finally, that, when my bed had just the right degree of heat, a thick covering of straw or corn-fodder would keep an even temperature, so that it would not be chilled by cold nights, nor scalded by the hot sun; and since I adopted this plan I have had little trouble in sprouting sweet potatoes. Leave the bed open in the middle of the day until it feels warm, and then cover closely, and it is probable that your bed will need no more attention until the plants begin to come through. . . . As the straw will prevent evaporation, the bed will not need watering until the sprouts appear, when it should be kept well watered until they are nearly large enough to set out. I think it hardens the plants at this stage to let them get pretty dry, but the bed should be thoroughly watered a few hours before the plants are drawn.

And here is another, from Alfred Rose, of Yates Co., N. Y.:

The potatoes should be covered with three inches of fine dry sand (sand is much preferable to loam, as it is warmer and cleaner); there will be a difference of a full week or ten days between beds covered with sand or loam, those covered with sand coming the earliest. After the sand, then cover with as fine dry straw or hay as can be procured, then the beds should be covered with boards in such a manner as to shed rain.

THORBURN'S BUSH LIMA BEANS, ETC.

On page 209 of our last issue, I told you I had written to Thorburn, asking him how many packets he had that he would let us have at 25 cts. each. His reply was, that he was sold out. I then wrote that we *must* have just a few, no matter what they cost, to which he has made no reply. If no reader of GLEANINGS can help us, I shall put an advertisement in *Popular Gardening* and in *American Garden*; and I feel sure that I can in some way strike one of Thorburn's customers. I am going to offer their weight in gold for a few of them, if I can not get them otherwise. All I can find out about them is given on page 209, March 1st. A bush lima bean has been hunted up away out in Minnesota (advertised by Northrup, Broslin, Goodwin & Co., Minneapolis), but they are of a deep creamy yellow color, and but little larger than Henderson's.

We have at this date, 8544 subscribers.

SPECIAL NOTICES.

THE IGNOTUM TOMATO.

If any subscriber has omitted to ask for his tomato seed, or if any one has failed to receive his package, make application at once and it will be mailed to you.

COLD-FRAME CABBAGE-PLANTS.

With the aid of our new cold greenhouse, we have secured a splendid lot of H. A. March's cold-frame Jersey Wakefield cabbage-plants. Price 10 cts. for 10; 80 cts. per 100; \$6.00 per 1000. If wanted by mail, add 5 cts. for 10, or 25 cts. for 100.

CLIFONE INTEGRIFOLIA, OR ROCKY-MOUNTAIN BEE-PLANT—SEED WANTED.

Since Samuel Wilson's advertisement of this California honey-plant, notwithstanding our caution—see page 148, a demand for the seed has sprung up that has exhausted our supply. Now, then, if any of the bee-friends in California or elsewhere have some seed to spare, we should be glad to get it. Please mail us a sample, and tell us how much you have and what you want for it. My impression is, that the demand will be short-lived. By the way, we should be very glad indeed to get reports from those who have tried the plant.

SEED POTATOES.

Our seed potatoes have wintered nicely, and are not sprouted a particle at the present writing. Early Ohio, Early Pearl, Lee's Favorite, and Empire State, we offer at 75 cts. per bushel, or \$2.00 for a barrel of three bushels. Beauty of Hebron, and Burbank, we offer at 50 cts. per bushel, or \$1.25 for a barrel of three bushels. In ordering potatoes we will pack them in our new slatted potato-box for 10 cts. per bushel extra. The potato-box, you know, is worth 16 cts.; but we make the above deduction because it saves providing some other package. The box will be worth 16 cts. to almost anybody. Where you are so far away that express and freight charges are quite an item, we will send potato-eyes, postpaid by mail, at 10c for 10; 80c per 100, or \$6.00 per 1000, of any of the above varieties.

PRICE LISTS RECEIVED.

Since our last issue we have received price lists of queens, bees, and apianian supplies in general, from the following parties, who will be glad to furnish them to applicants. Those marked with a star (*) also deal in fine poultry.

A. E. Manum, Bristol, Vt.*

J. M. Hyne, Stewartsville, Ind. (closing out his stock).

J. A. Nelson, Muncie, Wyandotte Co., Kansas.

O. Hoover & Co., Snydertown, Northumberland Co., Pa.

W. P. Beach, Ovid, Clinton Co., Mich.

J. C. Sayles, Hartford, Washington Co., Wis.

Ransom & Culver, Quincy, Mich.

Wakeman & Crocker, Lockport, N. Y. (section-formers only).

No. 1, \$2.00; No. 2, \$1.75; No. 3, \$1.50 | Knife,
No. 4, 1.25; No. 5, 1.00; No. 6, .65 | \$1.15



On receipt of the above price

SMOKERS and KNIVES

will be sent postpaid. Descriptive circulars will be sent on receipt of request card.

Bingham & Hetherington Smokers and Knives are staple tools, and have been used ten years without complaint, and are the only stovewood-burning clear-smoke bee-smokers; no going out, no vexation. Address

BINGHAM & HETHERINGTON, Abronia, Mich.
Please mention GLEANINGS. 67db

North-Shade Apiary.

Full colonies and nuclei at 50 cts. per comb, in good 8-frame L. hives (no charge for hives). Tested Italian queens, \$2.00 each. No queens for sale, except to go with bees. Will ship in light shipping-boxes instead of hives when so ordered. My broodframes are Simplicity, L. size.

Discounts:—\$25 to \$30, 10 per cent; \$30 to \$50, 15 per cent; \$50 to \$75, 20 per cent; \$75 to \$100, or larger orders, 25 per cent off from above prices.

CONDITIONS:—All colonies will be well stocked with brood and bees, all healthy and bright. Delivered f. o. b. cars at Alamo, in the best possible shipping order. No foul brood ever known near here. Will fill all orders first week in May. Remit by Am. Exp., money order, registered letter, draft on New York or Chicago, or by P. O. money order on Kalamazoo. Address

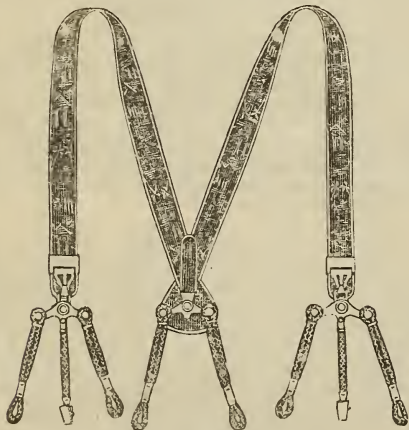
O. B. TOWNSEND,

7d

Alamo, Kalamazoo Co., Mich.

P. S.—40 to 200 acres of good land, located in Gratiot County, Mich., for sale cheap. The best location I know of for bee keeping. For further information, address as above.

SUSPENDERS FOR BEE-KEEPERS.



A number of customers have requested us to get a good suspender for bee-keepers, and a number of kinds have been suggested. The one shown above, called the "Foster," suits us as well as any we have seen. If you notice carefully you will see that, by the use of eveners, or equalizers, the strain on each button is the same. We can furnish them made of good white elastic web cotton ends, at 35 cts. per pair; silk ends, 50 cts. By mail, postpaid, 5 cts. per pair extra. In ordering please call them the "Foster." We can furnish very good white elastic suspenders, without the eveners, at 25 cts. per pair; by mail, 5c extra. Adjustable elastic armlets, 10c per pair, postpaid.

A. I. ROOT, MEDINA, OHIO.

EGGs FOR HATCHING, from choice S. C. B. Leghorns; can fill all orders promptly, great and small. Circulars free. A few O. I. C. pigs for sale. 41-5d
FILLMORE DECKER, New Florence, Westm. Co., Pa.



With Love at the helm, a successful voyage may be expected. In the guidance of our beautiful little craft, "THE BEE-KEEPER'S REVIEW," Love sits supreme. In other words, we are most thoroughly in love with our work. With feelings akin to a mother's, do we look upon the numbers of

the REVIEW. They are our mental children. It is said, that, although all the children of a family receive affection in the same degree, there is always a favorite child. This may not always be true; but certain it is, that every author of more than one book looks with special pride upon some one of these books. Reader, if you would be pleased to see the number of the REVIEW that comes the nearest to an ideal, send for the March No. for 1889. It will be sent free, and with it will be sent the May and June issues for 1888. Price of the REVIEW, 50 cts. a year. Back numbers furnished.

The Production of Comb Honey is a neat little book of 45 pages; price 25 cts. This book and the REVIEW one year for 65 cts. For \$1.00 the REVIEW will be sent two years, and the book "thrown in." Stamps taken, either U. S. or Canadian.

W. Z. HUTCHINSON,
7d Flint, Mich.

In responding to this advertisement mention GLEANINGS.

Non-Swarming Queens

For sale at \$1.00 each by April 15th. Safe arrival guaranteed. Each queen shall be a daughter of a queen that has refused to swarm for 3 years. I have two of her daughters that also refused to swarm last year. The chances are twenty to one that you will get a purely mated queen. Sample of bees sent, if desired.

R. B. WILLIAMS,

7-8d

Winchester, Tenn.



Eaton's Improved
SECTION CASE.
BEES AND QUEENS. Send for
free catalogue. Address
FRANK A. EATON,
5-16db Bluffton, Ohio.

In responding to this advertisement mention GLEANINGS.

AN OLD BEE-BOOK REVISED, and DADANT'S FOUNDATION.
See advertisement in another column.

Black and Hybrid Queens For Sale.

For the benefit of friends who have black or hybrid queens which they want to dispose of, we will insert notices free of charge, as below. We do this because there is hardly value enough to these queens to pay for buying them up and keeping them in stock; and yet it is oftentimes quite an accommodation to those who can not afford higher-priced ones.

FOR SALE.—30 black and 40 hybrids, which I will sell after the 10th of April at the rate of 10 of each kind each week, till all are sold. Price, black, 30 cts.; hybrids, 50 cts. J. W. POOLE, Russellville, Ark.

I have 8 or 10 hybrid queens that I will take 40 cts. each for, or 4 for \$1.50. Ready to ship now, or I will take trade for queens. J. W. TAYLOR, Ozan, Ark.

I have two black queens, young and prolific, which I should be glad to sell at 35 cts. each. B. C. GRIFFITH, Griffith, N. C.

Mismatched Italian queens for sale at 25 cts. each. L. A. RESSLER, Nappanee, Elkhart Co., Ind.

Brown queens, 25 cts. Italian hybrids, 30 to 40 cts. Carniolan hybrids, 50 cts. each. F. C. MORROW, Wallaceburg, Hempstead Co., Ark.

I have about 15 black and hybrid queens, ready April 15. I will ship in Peet cage, at 40 and 50 cts each, safe arrival guaranteed. R. H. GUTHRIE, Powhatan, Lawrence Co., Ark.

STRAW BLACK GOOSE RAPE DEW BERRIES

CURRENTS and GRAPES.

ADA Large, Late, Hardy, Prolific,
Black RASPBERRY, Latest of
all in Ripening.

FIRST-CLASS * PLANTS * AT * LOW * RATES.

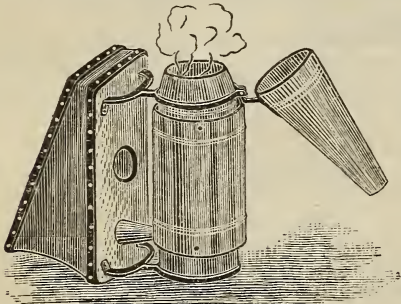
THEO. F. LONGENECKER,

Correspondence Solicited. 3tfdb Dayton, Ohio.

☞ In responding to this advertisement mention GLEANINGS.

1889. HELLO! HELLO! 1889.

How are supplies selling? You send for W. E. CLARK's illustrated price list. He is rock bottom for all supplies, and don't you forget it.



W. E. Clark's Improved Hinge-Nozzle Quinby Smoker. The Best Smoker Made.

Oriskany, - Oneida Co., - New York
3-14db ☞ Mention Gleanings.

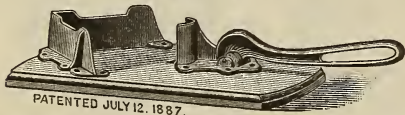
B. J. MILLER & CO., NAPPANEE, IND.,

BEE - HIVES AND ITALIAN QUEENS.

4¼x4¼ Sections, from 500 to 3000, at \$3.50 per 1000; if you want more than that, write for prices. Brood-frames, T-tin Cases, Foundation, and Metal Corners. Send for price list. 1tfdb

☞ In responding to this advertisement mention GLEANINGS.

SECTION PRESS. PRICE \$2.00.



PATENTED JULY 12, 1887.

For putting together one-piece sections. Every section square, and a smart boy or girl can fold 100 in six minutes. Try one and you will never regret it. Send to your supply dealer or to 5-16db

WAKEMAN & CROCKER, Lockport, N. Y.

☞ In responding to this advertisement mention GLEANINGS.

SAVE FREIGHT.

**BUY YOUR SUPPLIES NEAR HOME AND
SAVE FREIGHT.**

We carry a complete line of Hives, Sections, Smokers, Honey Extractors, etc. Our motto, good goods and low prices. Sections in large quantities, only \$3.25 per M. Illustrated catalogue for your name on a postal card.

R. B. LEAHY & CO.,

3-14db Box 11. Higginsville, Mo.

☞ In responding to this advertisement mention GLEANINGS.

THE . BEST . HIVES FOR THE LEAST MONEY.

BOTH SINGLE AND DOUBLE WALLED.

If you need any hives don't fail to send for my price list, as I make a specialty of hives, and think I have the best arranged hives on the market, at bottom prices. My hives take the Simplicity frame. 3tdb

J. A. ROE, Union City, Ind.

☞ In responding to this advertisement mention GLEANINGS.

LOOK HERE!

I will sell fine colonies of pure Italian bees, with their queens, in 10 frame Simplicity hives, 10 frames all worker comb and hive new, well painted, and guaranteed to arrive at your express office in good shape. Prices: 1 hive, \$7.00; 2 at one time, \$13.00; 4, same, \$24.00. Remember the risk of shipping lies with me. Address **JNO. A. THORNTON,** Exp. office, Ursa. Ill. Lima, Adams Co., Ill. 6-11db



I HAVE COME

To say E. Baer will close out the supplies he has on hand, consisting of 100 M. sections, 100 chaff hives, 2000 separators, 4 M. wide frames, far below cost. They are first-class goods, the same as I have sold in the past, and must be sold. Please state what goods you can use, and I will quote you bottom prices. Also a few choice tested Italian queens in June and July at 75c each. 6tfdb

EZRA BAER, Dixon, Lee Co., Ill.

☞ In responding to this advertisement mention GLEANINGS.

Do You Want Knowledge?

Send a postal for price list of International Encyclopedia, 15 vols., royal 8vo, over 13,000 pages, with maps and illustrations. It excels all in comprehensiveness, conciseness, lateness of information, convenience, and cheapness. C. O. D. Liberal discount for freight charges. 6-7-8d

A. H. VANDOREN,
Mons, Bedford Co., Va.

☞ In responding to this advertisement mention GLEANINGS.

BEES and QUEENS!

Ready to Ship.

Friends, if you are in need of queens or bees to replace in hives where they have been lost during the winter, I can accommodate you at the following low prices: Italian bees, ¼ lb. 65 cts.; 1 lb., \$1.00. Untested queens, \$1.00; tested, \$1.50. Hybrid bees, ½ lb., 50 cts.; 1 lb., 90 cts. Hybrid queens, 75 cts. Prices by the quantity will be sent on application. 6-7-9-11d

W. S. CAUTHEN,

Heath Spring, Lancaster Co., S. C.

☞ In responding to this advertisement mention GLEANINGS.

HONEY, BEES, QUEENS, SUPPLIES.

Catalogue Free.

OLIVER FOSTER, MT. VERNON, IOWA. 3tfdb

2 STORY Langstroth B Hives, \$1.00; 1-story Simplicity B-Hives, 45 cts. These hives have frames and covers, all ready for bees, except they are in flat. 6-7d

T. A. GUNN, Tullahoma, Tenn.

**MUTH'S
HONEY-EXTRACTOR,
SQUARE GLASS HONEY-JARS,
TIN BUCKETS, BEE-HIVES,
HONEY-SECTIONS, &c., &c.
PERFECTION COLD-BLAST SMOKERS.**

Apply to **CHAS. F. MUTH & SON,**

CINCINNATI, O.

P. S.—Send 10-cent stamp for "Practical Hints to Bee-Keepers." (Mention Gleanings.) 1tfdb

FOR THE SEASON OF 1889.

Headquarters in the South.

ELEVENTH ANNUAL CATALOGUE NOW READY.

A steam-factory exclusively for the manufacture of Bee-Keepers' Supplies.

ITALIAN QUEENS.

Tested, ready in March. Untested, by April 1st. Contracts taken with dealers for the delivery of a certain number of queens per week, at special figures.

FOUR-FRAME NUCLEUS,

with pure Italian queen, containing 3 pounds of bees when secured—in April and May, \$4.00; after, 25 cts. less. Safe arrival and satisfaction guaranteed on all queens and nuclei.

For more particulars, send for Eleventh Annual Catalogue.

1-3-5d

P. L. VIALLO, N.

Bayou Coula, Iberville Parish, La.

In responding to this advertisement mention GLEANINGS.

A NEW BOOK ON BEES, and DADANT'S FOUNDATION. See advertisement in another column.

HEADQUARTERS IN THE WEST

FOR THE MANUFACTURE AND SALE OF

Bee-Keepers' Supplies.

CHAFF AND SIMPLICITY HIVES FURNISHED AT A GREAT REDUCTION IN PRICE.

A full line of supplies always on hand. Also Italian queens and bees at a very low price. Send for large illustrated price list. 1-23d

A. F. Stauffer, Sterling, Ill.

IMPORTED QUEENS.

In May and June, each - - - - - \$2 00
In July and August, each - - - - - 1 80
In September and October, each - - - - - 1 40

Money must be sent in advance. No guarantee on shipments by mail. Queens sent by express (8 at least), which die in transit, will be replaced if returned in a letter.

1-11d CHAS. BIANCONCINI, Bologna, Italy.

In responding to this advertisement mention GLEANINGS.

Maple Sugar and The Sugar-Bush

With Appendix, Just Published.

THIS IS A NEW BOOK BY

PROF. A. J. COOK,

AUTHOR OF THE

BEE-KEEPER'S GUIDE, INJURIOUS INSECTS OF MICHIGAN, ETC.

The name of the author is enough of itself to recommend any book to almost any people; but this one on Maple Sugar is written in Prof. Cook's happiest style. It is

—* PROFUSELY * ILLUSTRATED. —*

And all the difficult points in regard to making the very best quality of Maple Syrup and Maple Sugar are very fully explained. All recent inventions in apparatus, and methods of making this delicious product of the farm, are fully described.

PRICE: 35 Cts.; by Mail, 38 Cts.

A. I. ROOT, Medina, O.

CARNIOLAN QUEENS A SPECIALTY.

Largest and Purest Carniolan Apiary in America. Send for descriptive circular and price list. Address

ANDREWS & LOCKHART,

3tfd Pattens Mills, Washington Co., N. Y.

In responding to this advertisement mention GLEANINGS.

ITALIAN QUEENS.

Tested, \$2.00, \$1.50, and \$1.25, in Apr., May and June. One untested, May, \$1.00; after June 1st, .75.

Three untested, May, \$2.50; after June 1st, \$2.00.

Three-frame nuclei, with untested queen, May, \$3.50; June, \$3.00; after, \$2.60; with tested queen, add 50 cts. For prices of 2-frame nuclei bees, per lb. and ½ lb., full colonies, foundation, and bee-keepers' supplies, write for price list. Address

6-11db JNO. NEBEL & SON, High Hill, Mo.

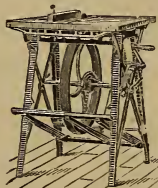
Western BEE-KEEPERS' Supply Factory.

We manufacture Bee-Keepers' supplies of all kinds, best quality at lowest prices. Hives, Sections, Foundation, Extractors, Smokers, Crates, Veils, Feeders, Clover Seeds, Buckwheat, etc. Imported Italian Queens. Queens and Bees. Sample Copy of our Bee Journal.

"The Western Bee-Keeper," and latest Catalogue mailed Free to Bee-Keepers. Address JOSEPH NYSEWANDER, DES MOINES, IOWA

In responding to this advertisement mention GLEANINGS.

Barnes' Foot-Power Machinery.



Read what J. I. PARENT, of CHARLTON, N. Y., says—"We cut with one of your Combined Machines last winter 50 chaff hives with 7-inch cap, 100 honey-racks, 500 broad frames, 2,000 money-boxes, and a great deal of other work. This winter we have double the amount of bee-hives, etc., to make, and we expect to do it all with this Saw. It will do all you say it will."

Catalogue and Price List Free. Address W. F. & JOHN BARNES, 545 Ruby St., Rockford, Ill.

When more convenient, orders for Barnes' Foot-Power Machinery may be sent to me. A. I. Root. 25tfd

VANDERVORT COMB FOUNDATION MILLS.

Send for samples and reduced price list.

1tfd JNO. VANDERVORT, Laceyville, Pa.

In responding to this advertisement mention GLEANINGS.

SOUTHERN HEADQUARTERS

FOR EARLY QUEENS,

Nuclei, and full colonies. The manufacture of hives, sections, frames, feeders, foundation, etc., a specialty. Superior work and best material at "let-live" prices. Steam factory, fully equipped, with the latest and most approved machinery. Send for my illustrated catalogue. Address

1tfd J. P. H. BROWN, Augusta, Ga.

ON 30 DAYS' TRIAL.

THIS NEW ELASTIC TRUSS

Has a Pad different from all others, is cup shape, with Self-adjusting Ball in center, adapts itself to all positions of the body, while the ball in the cup presses back the intestines just as a person does with the finger. With light pressure the Hernia is held securely day and night, and a radical cure certain. It is easy, durable and cheap. Sent by mail Circulars free. EGGLESTON TRUSS CO., Chicago, Ill.

In responding to this advertisement mention GLEANINGS.

GLEANINGS IN BEE CULTURE.

✧ BEE-KEEPERS' * SUPPLIES. ✧

QUALITY AND WORKMANSHIP UNSURPASSED.

We are prepared to furnish **Bee-Keepers** with **Supplies Promptly**, and with goods of uniform excellence, as heretofore. Our Hives all take the **Simplicity Frame**. The "**Falcon**" **Chaff Hive** and the "**Chautauqua**," with **Dead-Air Spaces**, are both giving universal satisfaction.

We manufacture a **Full Line** of **Bee-Keepers' Supplies**, including "**Falcon**" **Brand Foundation**, and gladly

FURNISH ESTIMATES, AND SOLICIT CORRESPONDENCE.

SEND * FOR * LARGE * ILLUSTRATED * PRICE * LIST * FOR * 1889 * FREE.

THE W. T. FALCONER MANUFACTURING CO.,

Jamestown, N. Y.

1 2tdb

Successors to **W. T. FALCÓNER.**

In responding to this advertisement mention **GLEANINGS**.

FOUNDATION.

We manufacture the best foundation, and after it is drawn out by the bees it is perfectly white. Made from selected wax. All orders filled promptly (in the season) or money returned by next mail.

Address for prices, etc.,
1tfd

F. A. SALISBURY, Syracuse, N. Y.

In responding to this advertisement mention **GLEANINGS**.

NEW YORK.

FOREIGN ORDERS SOLICITED.

NEW JERSEY.

EASTERN * DEPOT

(Bees.) —FOR— (Queens.)

EVERYTHING USED BY BEE-KEEPERS.

EXCLUSIVE MANUFACTURER OF THE

STANLEY AUTOMATIC HONEY-EXTRACTOR.

Dadant's Foundation, Wholesale and Retail.

WHITE POPLAR OR BASSWOOD SECTIONS.

One-Piece, Dovetail, or to nail. Any Quantity, any Size.

COMPLETE MACHINERY—FINEST WORK.

Send for Handsome Illustrated Catalogue, Free.

E. R. NEWCOMB, Pleasant Valley, Dutchess Co., N. Y.

In responding to this advertisement mention **GLEANINGS**.

MASS.

CONN.

3tfd

BEE SUPPLIES.

Wholesale and Retail.

Illustrated catalogue FREE to all.

We have the largest steam-power shops in the West, exclusively used to make **EVERYTHING** needed in the Apiary, of practical construction and at the **LOWEST PRICES**. Italian bees, queens, 12 styles of Hives; Sections, Honey-Extractors, Bee-Smokers, Feeders, Comb Foundation, and everything used by bee-keepers, always on hand.

Address 3-1tfd

E. KRETCHMER, COBURG, MONTGOMERY CO., IOWA.

In responding to this advertisement mention **GLEANINGS**.



The value of a one-piece section depends on its folding without breaking. Our process of manufacture secures that end. Our catalogue explains how it is done. Our No. 1 sections are perfect in

all respects, and No. 2 are not imperfect enough to impair their utility. We also make the nicest of **WOOD SEPARATORS** — keep **DADANT'S FOUNDATION**, and furnish three kinds of **BERRY PACKAGES**.

Address, as in cut, for catalogue and special prices. (Mention *Gleanings*.) 1-12db

J. C. SAYLES, HARTFORD, WIS.,

Manufactures Apiarian Supplies of Every Description. Catalogue Free to All.

3tfd Send Your Address.

LOOK HERE!

A complete hive for comb honey, \$1.30. No. 1 V-groove one-piece sections, \$3.50 per M. Price list free.

3tfd **J. M. KINZIE, Rochester, Oakland Co., Mich.**

In responding to this advertisement mention **GLEANINGS**.

S. D. McLEAN

Will sell bees by the pound, Colonies, Nuclei, and Queens. Cheap. Write for terms to COLUMBIA, TENNESSEE.

1889
3-9d

1889